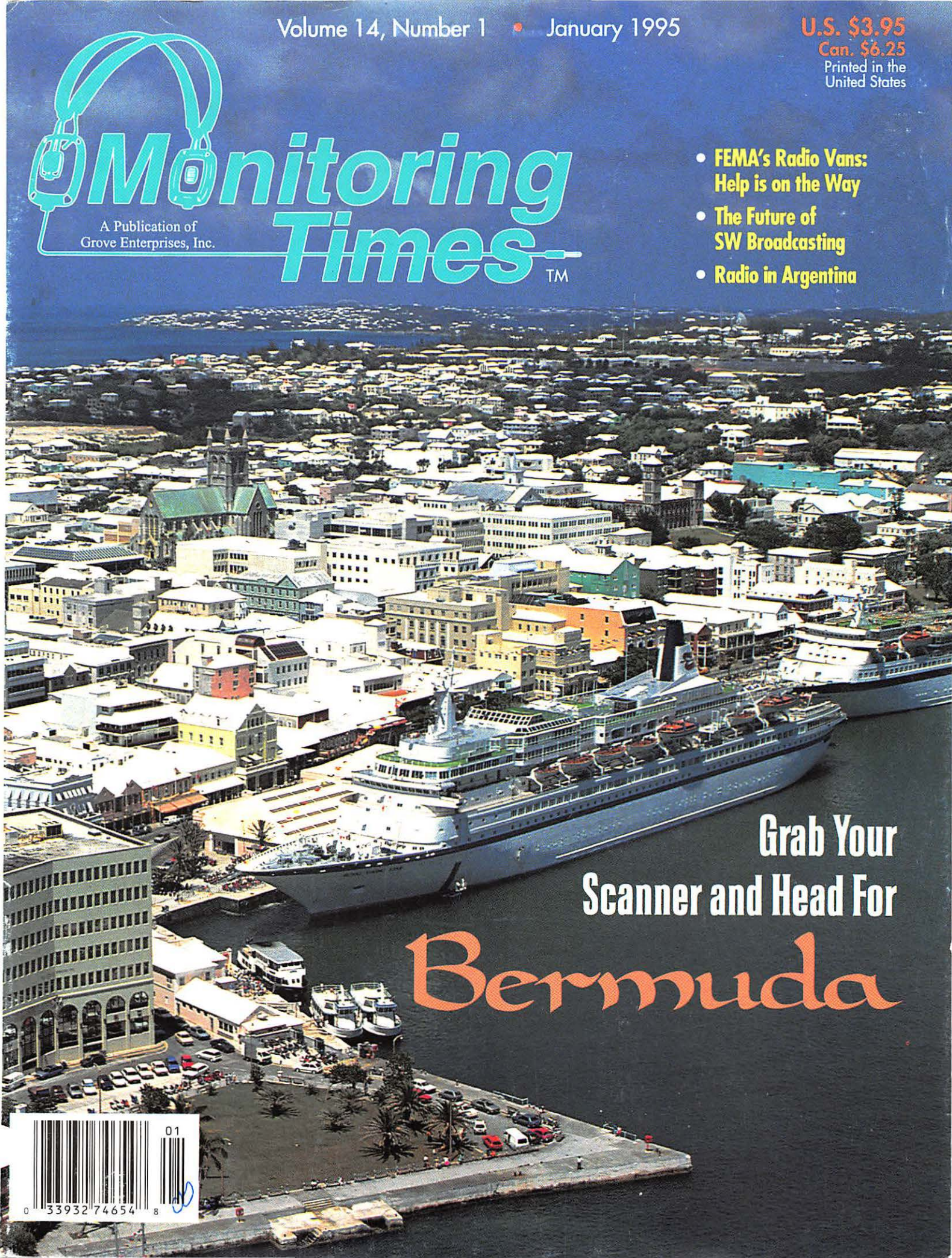
Volume 14, Number 1 • January 1995

U.S. $3.95
Can. $6.25
Printed in the United States

Monitoring Times™

A Publication of Grove Enterprises, Inc.

- FEMA's Radio Vans: Help is on the Way
- The Future of SW Broadcasting
- Radio in Argentina



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Monitoring Times™

Vol. 14, No.1 January 1995

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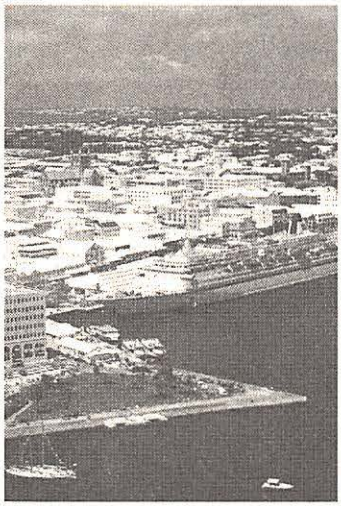

Cover Story

Scanning Beautiful Bermuda
by Michael Shaner

When your scanner gets tired of listening to snowplows being mobilized by the highway department and the weather-related traffic jams on and above the ground, give your scanner a vacation — take it to Bermuda! With the constant merchant and tourist air and marine traffic, plus all the usual public safety, business, and military communications, your scanner will enjoy a veritable smorgasbord of frequencies.

Michael Shaner's rare list of frequencies was compiled during frequent visits to the island. Tired of looking at snow white? Trade it in for your tropical whites and cruise in to Hamilton Harbour, as in our cover photo (courtesy of the Bermuda Dept. of Tourism). *See page 10.*

Worthy Receivers

Magne puts the AR3030 shortwave receiver under close scrutiny and finds it a generally likable receiver for its price range. See page 100 for a description of the features and performance of this table-top model.

In his first column for *Monitoring Times*, Bob Parnass addresses a frequently-asked question: how does the new PRO-2035 really compare with its classic predecessor—Radio Shack's PRO-2006 scanner? (See page 98) For a look at the PRO-2035's innards, Bill Cheek performs the dissection on page 108.

DEPARTMENTS

MONITORING TIMES (ISSN: 0889-5341) is published monthly by Grove Enterprises, Inc., Brasstown, North Carolina, USA.

Address: P.O. Box 98, 300 S. Highway 64 West, Brasstown, NC 28902-0098
Telephone: (704) 837-9200
Fax: (704) 837-2216 (24 hours)
BBS: (704) 837-9200 (M-F 5:30 pm-8 am; 24 hours on weekends)

Subscription Rates: $21.95 in US and $32.00 US funds elsewhere; Label indicates last issue of subscription

Postmaster:
Send address changes to *Monitoring Times*, P.O. Box 98, Brasstown, NC 28902-0098.

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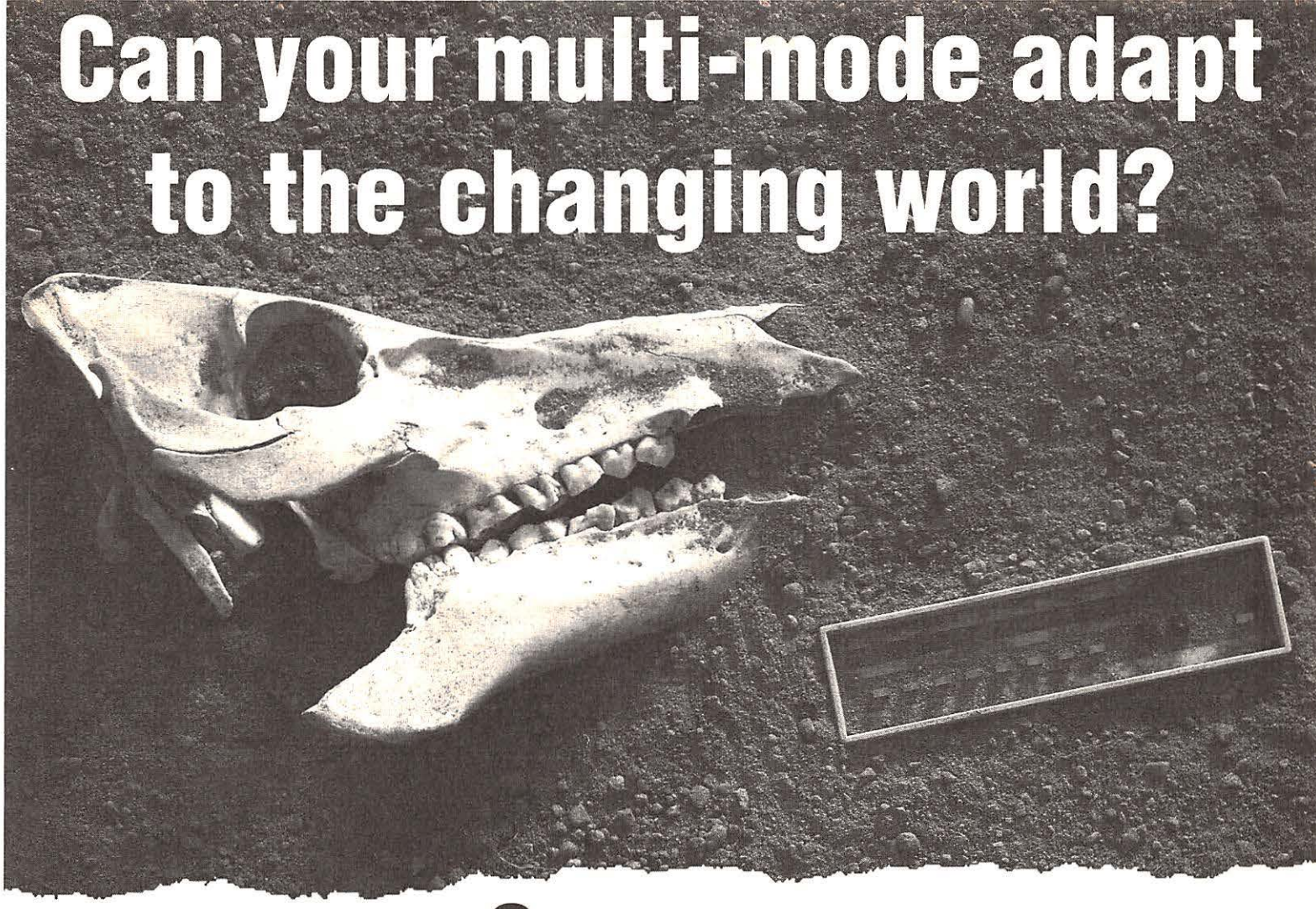
Can your multi-mode adapt to the changing world?



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LETTERS

The Adventure of Radio

■ I very much enjoyed a newspaper clipping from the Quincy (Mass.) *Patriot* that was sent to me by Bob Fraser of Cohasset, MA. As Bob says, the article points out that "Between the cellular phones and the new satellite positioning system, you can't get lost no matter how hard you try."

The article's author, John Markoff of the *NY Times*, draws upon several recent examples of cellular and GPS technology being used in the "back country." "Wilderness is supposed to be a place where, compasses notwithstanding, there is always the possibility of getting lost, where one must pit one's wits against the elements to survive."

Nowadays, rangers say they may find a rock climber calling San Diego on a hand-held radio, a back-packer calling the office in New York on cellular phone to say he can't make it to work due to illness, and of course, the increasing number of cellular phone calls for rescue from novices who challenge the wilderness, but who aren't prepared to accept the consequences.

"It diminishes the value of wilderness to the human spirit if you're forever safe," said Jay Watson of the Wilderness Society, who pointed out wilderness areas were set up, in part, to be "an escape from technology."

Writer Markoff speculates, however, that "the new back country may become the world of artificial computer networks known as cyberspace."

"One can already become lost for hours in the neck of the Internet called the World Wide Web," he says. "In this artificial frontier, one is challenged not physically but mentally. It is a world for cerebral adventures."

In November's feature article "LF: The Last Frontier," author Robert Williams speculated that recapturing the excitement of one's early days in radio might now be possible only in low-tech, low frequency projects. But I think John Markoff nailed it when he quoted from the poet Gary Snyder: "A person with a clear heart and open mind can experience the wilderness anywhere on earth. It is a quality of one's own consciousness."

For those of us who have gravitated to the world of radio, there will always be wilderness and adventure to be had when listening to the airwaves and tinkering with one's radio shack. If you find radio has lost its thrill for you, however, perhaps it is you who are lost. A friend of mine is introducing the world of electronics and radio to a boy recently from the streets of New York to whom the whole world of knowledge is an incredibly exciting adventure. Sharing radio with a new friend or a classroom of kids can pave the way to rediscovering that first excitement.

The editor in her office. Photo by G. Serra.

Motorola vs. Harris; US Gov vs. Harris

■ Following November's report on the arrest of *Frequency and Intelligence Directory* author Francis J. Harris (p.30), there is now more to the story, as well as a few corrections that need to be noted.

A reference was made in the article to "lab versions of Radio Service Software which Motorola does authorize for use or distribution to a non-Motorola entity." Unfortunately, the text should have read, "does NOT."

The "lab tool" version enables the user to access systems other than just his own units. Joseph Krause, an attorney for Motorola, states that "Lab versions are also protected under the United States Copyright Laws. Unauthorized use, acquisition, distribution, copying, or modification of any Radio Service Software, including lab versions, infringes on Motorola's copyrights."

Also, although the article stated that the STX-821 in Harris' possession at the time of his arrest, "was discovered programmed with nearly everything in the Sunshine State," this obviously refers to 800 MHz frequencies. While we do not know the *exact* channels, police reports indicate the radio contained more than four "talk groups." In Motorola's civil case against Harris, he is charged with possession of System Keys to 43 systems, plus the lab tools, which would have given him the ability to access any frequency within those systems.

Harris has disputed the claim by "reliable sources" that the Motorola dumpsters were ever padlocked and chained. Author Rodriguez obtained the information from a source he had known for many years to be reliable, but was not able to elicit comments from either Harris or Motorola prior to submitting his report.

Subsequent to the examination of equipment and software taken from Harris' home in connection with the civil case, a federal indictment was brought against Harris for violation of section 10-29A4 of the criminal code — that is, for possession of all equipment and software necessary to clone cellular phones. He remains incarcerated.

FM SubCarriers

■ Steve Johnson, a broadcast engineer from York, PA, wishes to clarify a couple of concepts in the September article by Bruce Elving.

"In the second column, page 26, the author states that 'an FM station could offer ... talk or music on its *sideband*.' It is incorrect to refer to the subcarrier signal as being the sideband — that's a technical term with an entirely different meaning, and could confuse readers not already familiar with the subject.

"In the third column, the author describes the FM subcarrier signal as having 'only about 10 percent of the *effective power* of the main station.' This is not the case; the subcarrier has about 10 percent of the total *modulation* of the station.

"Stereo FM stations in the US transmit a baseband full of signals, all at the full station RF power. These signals include the main mono signal (the sum of Left and Right program audio channels) occupying up to 15 kHz, a continuous pilot signal at 19 kHz, and a double-sideband, suppressed-carrier signal centered at 38 kHz (itself modulated with the difference between Left and Right audio channels). SCS subcarriers occupy the range 53-99 kHz of the baseband audio.

"It is important to realize that all these signals are summed together and the resulting *composite baseband* signal is then used to FM modulate the transmitter. Each subcarrier is usually allowed about 10 percent of the total modulation. At the receiver, this reduced signal injection results in a lower signal-to-noise ratio than the main channel of the station, and relatively less coverage is possible.

"Thanks for the chance to help explain this relatively complex topic."

On another matter, Bruce Elving says, "Lest Larry Miller and others be concerned about the quality of my radios and electronics devices (Oct., p 96), I do offer refunds, subject to a modest handling charge, and I accept trade ins. I think most people are very pleased with my subcarrier mods, realizing that these are done on a custom basis. It's almost a one-on-one art, rather than every radio coming out a clone of every other radio.

"One radio that is proving to be quite popular is the small GE 7-2662 model, AC-

(Continued on page 114)

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Recently, the FCC amended Parts 2 and 15 of its rules to prohibit the manufacture and importation of scanning radios capable of intercepting the 800 MHz. cellular telephone service. The Electronics Communications Privacy Act prohibits the intentional interception of cellular telephone transmissions. Supplies of scanners that are capable of being easily modified to receive full 800 MHz. coverage such as the Bearcat 200XLT are in *critically* short supply. Today could be your last chance to buy your Bearcat 200XLT scanner. Signal intelligence experts, public safety agencies and people with inquiring minds that want to know, depend on the Bearcat 200XLT *handheld* scanner to intercept just about any radio transmission. You can also program frequencies such as police, fire, emergency, race cars, marine, weather, and other broadcasts into 10 banks of 20 channels each.

A modification sheet with instructions to restore full 800 MHz. coverage for our Bearcat 200XLT may be ordered for $8.00. To order your Bearcat scanner, call 1-800-USA-SCAN.

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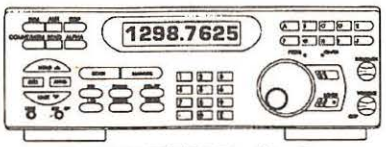

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The new Bearcat 8500XLT gives you pure scanning satisfaction with amazing features like Turbo Scan. This lightning-fast technology featuring a triple conversion RF system, enables Uniden's best scanner to scan and search up to 100 channels per second. Because the frequency coverage is so large, a very fast scanning system is essential to keep up with the action. Other features include ***VFO Control*** - (Variable Frequency Oscillator) which allows you to adjust the large rotary tuner to select the desired frequency or channel. ***Counter Display*** - Lets you count and record each channel while scanning. ***Auto Store*** - Automatically stores all active frequencies within the specified bank(s). ***Auto Recording*** - This feature lets you record channel activity from the scanner onto a tape recorder. You can even get an optional ***CTCSS Tone Board*** (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. ***20 banks*** - Each bank contains 25 channels, useful for storing similar frequencies in order to maintain faster scanning cycles. For maximum scanning enjoyment, order the following optional accessories: **PS001** Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter $14.95; **PS002** DC power cord - enables permanent operation from your vehicle's fuse box $14.95; **MB001** Mobile mounting bracket $14.95; **BC005** CTCSS Tone Board $54.95; **EX711** External speaker with mounting bracket & 10 feet of cable with plug attached $19.95. The BC8500XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited warranty from Uniden. Order your BC8500XLT from Communications Electronics Inc. today.

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Soaring With Pigeons

■ Look, Comrad! Bird on window ledge is taking notes!

What kind of transmitter has two wings and roosts on the ledges of foreign embassies? A surgically-implanted pigeon.

According to a new book, *Spyworld*, the United States used live pigeons with transmitters embedded in their chests and antenna wires drawn through their wings, to spy on foreign embassies located in the United States. One National Security Agency officer quoted in the book said that the pigeons provided "incredibly good results," especially during the summer when windows were open.

In another operation, a fiberglass replica of a fallen tree branch was outfitted with a transmitter and placed next to an outside bench used by the Chinese ambassador for private conversations.

Spyworld was written by former Canadian intelligence official Michael Frost and Michael Gratton.

Wiretap Bill Passes

■ Congress has passed legislation that requires phone companies to guarantee law enforcement agencies access to new digital phone networks. The bill authorizes the government to reimburse phone companies up to a total of $500 million to install equipment of software to make it possible for the government to access telephone and other communications.

The phone companies say that while the final bill was "immeasurably improved" over the initial drafts, they remain "deeply troubled."

Incidentally, the bill expands privacy and security protection to cordless phones and certain wireless data transmissions.

Going English

■ Police and dispatchers in Delray Beach, Florida, are dropping their radio 10-codes. Police adopted the system in the 1940s when poor sound quality made short, clear communications necessary. Over time, the 10-Codes got so involved that they became unintelligible, even to some police officers.

Add to that the confusion between "10 Codes" and "Signal Codes" and you've got a real mess on your hands. A simple "10-60" (assist a motorist) can easily be confused with a "Signal 60" (sniper fire).

An officer who goes 10-42 is simply going out of service at home. If he announces that he's going Signal 42, that's child molesting.

Some are used so infrequently that officials doubt anyone would know what's happening. "If we give a signal 45 (airplane crash) over the air," says Boynton Beach Police Communications Manager Hugh McCaffrey, "all you'd hear is sun visors slapping down when the guys go to look it up."

The final straw occurred during Hurricane Andrew when Delray Beach officers couldn't understand Metro-Dade PD's even more obscure "Q" and "Z" Codes. To compensate, the two departments had to use everyday language to understand one another. "What a novel idea," said Capt. Alberto Melis of the Delray Beach Police Department—"using plain English."

Trooper Sues Boss Over Phone

■ Dan Howard, an Oklahoma Highway Patrol Officer, has filed suit against his supervisors, saying they illegally monitored his cellular phone conversations. One time, the suit claims, the phone rang after Howard had hung up from a call with a fellow trooper. It was Howard's boss, who proceeded to reprimand the trooper for the conversation. After Howard complained, his boss told him that he would continue to monitor phone calls because it wasn't illegal.

Telephone Surprise

■ Last spring, Angie Reed picked up the phone and had a long chat with a friend in Delphi, Indiana. They talked about all kinds of things. Some time later, when the call was all but forgotten, Ms. Reed was charged with possession of marijuana.

"I was shocked," said Reed. She was using a standard, wired telephone. What she didn't know was that her friend was using a cordless phone. What neither of them knew was that a Delphi police officer with a scanner had been tuned in to that phone and, based on what he heard, filed the charges.

Getting Priorities Right

■ War still rages in the devastated African nation of Angola. Unable to come to a resolution of the conflict that has claimed countless tens-of-thousands of lives, the carnage rolls on unrelenting. That's why it was like a little bit of sunshine when Angolan Minister of Social Communication, Mr. Hendrick Vaal Neto announced the inauguration of the first TV service for the Kuito area of the country. "At least the people will be entertained," said one official.

TV Hits New Low

■ Palestinian TV has hit a new low—literally. Viewers in the East Bank who turned to Channel 13 can now watch their own TV station, which broadcasts from Jericho, near the lowest point on earth. The transmitter is nearly 400 meters below sea level. The station is headquartered at the Hisham Palace Hotel.

Shack TV?

■ Radio Shack has formed a new division to explore opportunities in areas such as long distance telephone service and national paging. The electronics retailer says that the New Venture Group will also consider other technology-based services, including security monitoring and satellite TV programming.

Also on the communications bandwagon is an unlikely challenger. The Southland Corp, owner of 7-11 convenience stores, has announced that they are now selling long-distance telephone debit cards.

Widow Claims Cell Phone Caused Cancer

■ The family of a Florida man has sued a cellular phone manufacturer alleging that electromagnetic radiation from the phone caused or aggravated the brain cancer that killed William P. Hartwig. This brings to at least five the number of suits filed against manufacturers or cell phones; none of the disputes has been resolved, says reporter Bill Duryea. The latest lawsuit seeks more than $2 million in damages.

The Cellular Telecommunications Industry Association insisted in December that a study proved that cellular phones posed no health threat to users. But, says Duryea, that study has been debunked, and the Association, while saying the phones are safe, has said it will continue to finance research.

"Communications" is written by Larry Miller from material kindly provided by the following fine folks: Dave Alpert, New York, NY; J.R. Berry, Columbus, OH; Jeff C.; Paul Casey, Kanata, ON; Mark Crumpler; Dr. Ed Ethridge, Huntsville, AL; Ulis & Carmelina Fleming, Glen Burnie, MD; William Gallanger, Anchorage, Alaska; Michael Hilton, Schenectady, New York; Paul Koepke, Goshen, Indiana; The Kuntzmans, Boynton Beach, Florida; Dick Lythgoe, Evansville, Indiana; Dr. Ivan Messmer, Croton-On-Hudson, NY; Eric Sanford, Wasilla, AK; Zack Schindler, Ferndale, MI; Dick Sharp, Oklahoma City; and Greg Strauss (via Roger Cravens).

Many thanks to everyone for an incredible turnout! Other publications consulted in this worthy endeavor include BBC Monitoring's *Summary of World Broadcasts* and *National Scanning*.

You can join the Communications Media Monitoring Team (CMMT). Scan your local newspapers for articles on radio and send them to: Larry Miller, Box 98, Brasstown, NC 28902.

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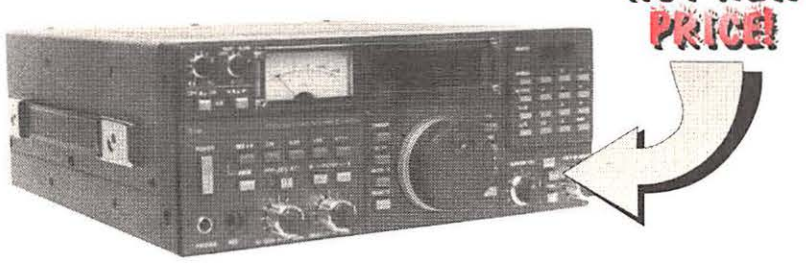

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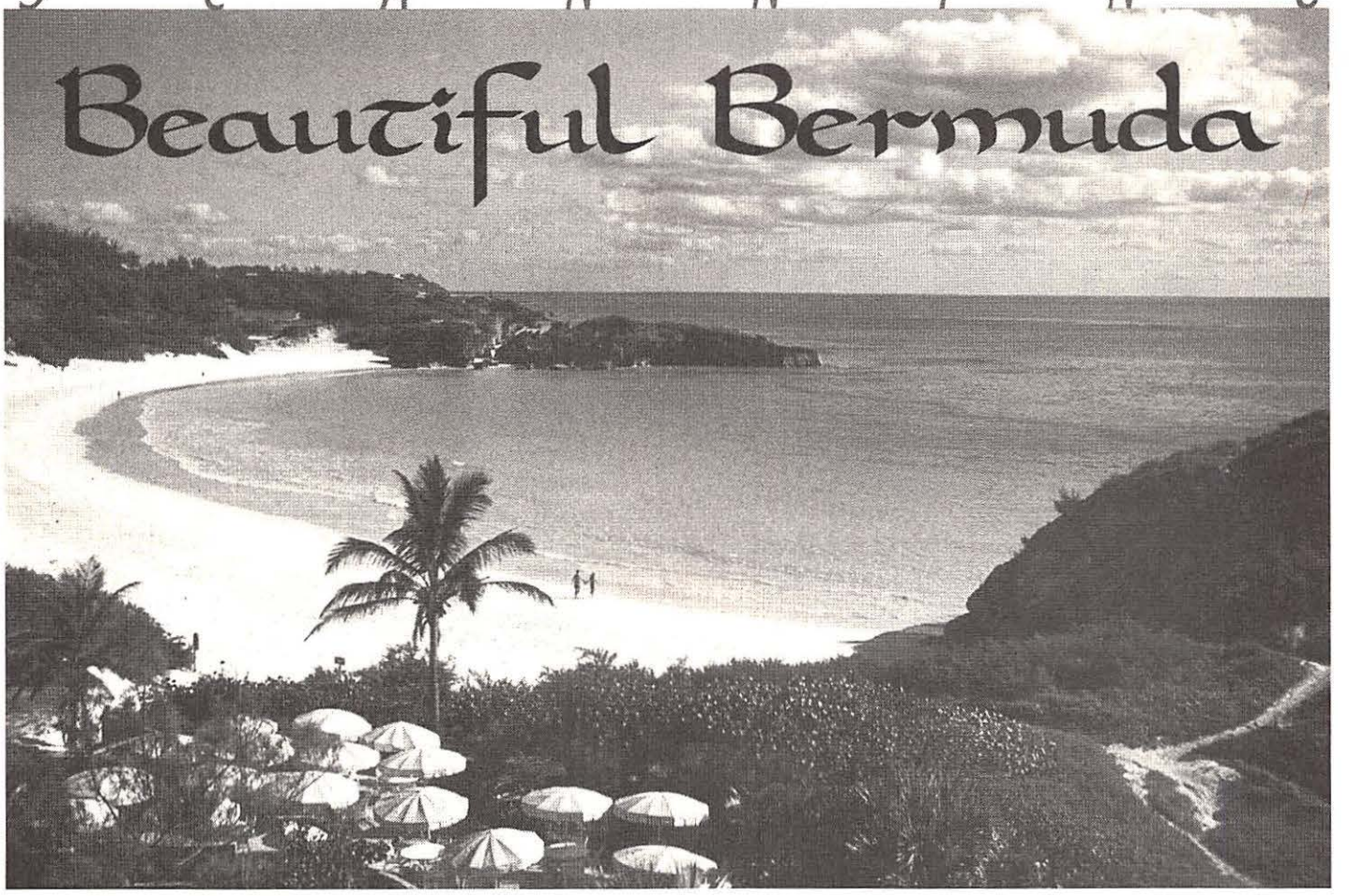
Beautiful Bermuda



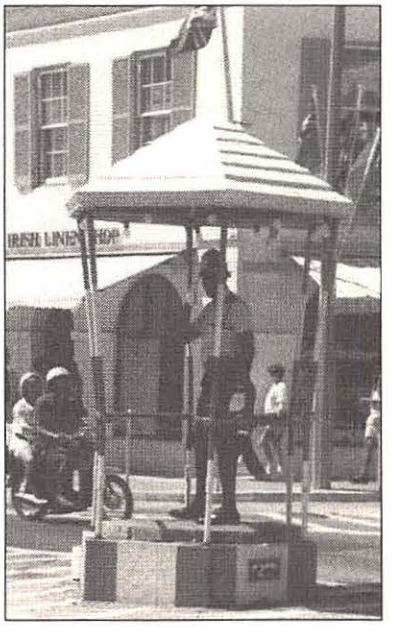
Story and Photos by Michael Shaner WA2GGE

With an average year-around temperature of 70 degrees, the Island offers abundant sightseeing opportunities ranging from the quaint Town of St. Georges (settled in 1610), to glass bottom boat rides above the coral reefs.

The Bermudian Government limits cars to one per household, but with the excellent low cost public transportation system and the unlimited use of mopeds and scooters, access to all parts of the island is not a problem. For the tourist, moped and scooter rental shops, taxis, and horse drawn carriages are readily available. However, bear in mind Bermudians drive on the left side of the road, and operating a moped or scooter takes a bit of practice.

Bermuda is a scanner listener's delight. Two-way radios, from cellular telephones to business and public safety communications, are widely used by everyone. And, by the way, if you take my advice and come by cruise ship, check out 457.525 MHz and the rest of the itinerate business frequencies for on board communications, especially if you use Royal Caribbean Cruise Lines.

With a tip of the hat to Ken Simmons VP9BO and Hylan Simons, owner of Radio Shack in Hamilton, here is a list of the frequencies on the Island of Bermuda. Happy Scanning!



Cellular Telephones

880.83 - 889.98 MHz

Television

Channel 7	ZFB (ABC)	Audio 179.75 MHz
Channel 9	ZBM (CBS)	Audio 191.75 MHz
Channel 11	VSB (Ind)	Audio 203.75 MHz

AM Radio

ZBM	1340 kHz
ZFB	1230 kHz
VSB	1450 kHz
VSB	1280 kHz
VSB	1160 kHz Island information daytime, BBC World Service at night

FM Radio

ZBM-FM	89 MHz
ZFB-FM	95 MHz
VSB-FM	106 MHz
	100.1 MHz Island-wide Bermudian Government Emergency Channel

Police

460.900 MHz
460.650 MHz

Note: The majority of Bermuda Police frequencies are digitally scrambled above 1000 MHz.

Fire

150.050 MHz Alerting
816.490 MHz, 817.490 MHz,
818.490 MHz, 819.490 MHz,
820.490 MHz (Trunked)

Note: The main fire station is located in Hamilton and is manned by paid on-duty firefighters. Paid off-duty firefighters are paged out for serious alarms. A smaller fire station in St. Georges is manned by a paid driver and volunteers. The U.S. Naval Station Fire Department also responds for mutual aid on serious fires.

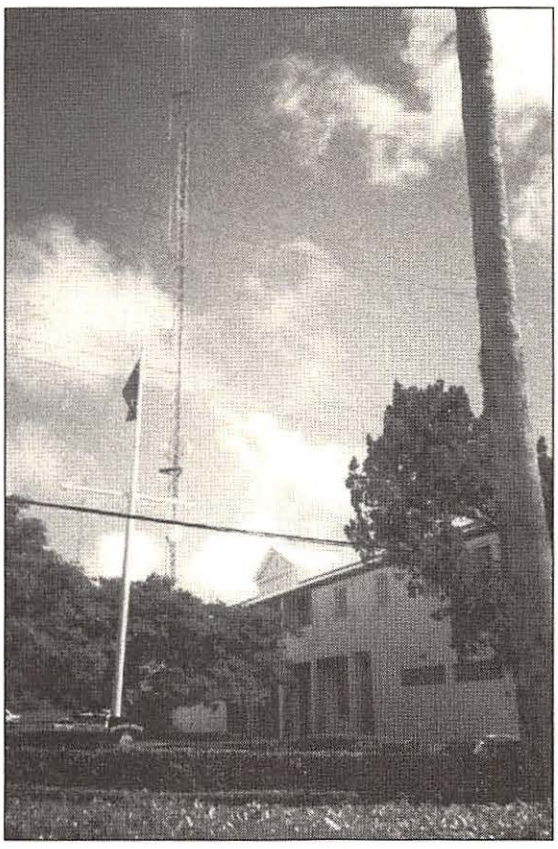
EMS / Hospital

150.975 MHz	Bermuda Hospital
150.175 MHz	Bermuda Fire Dept. Ambulance
150.170 MHz	St. Johns Hospital Ambulance
150.965 MHz	Bermuda Hospital (Paging)

Note: Since the advent of cellular telephone on the island most EMS communications are via cellular phone.

Above: an operator on duty at Bermuda Harbor Radio.

Below: communications antenna at Bermuda Police Headquarters.



Utilities

168.400 MHz	F/1 Bermuda Telephone Co.
169.325 MHz	F/2 Bermuda Telephone Co.
167.850 MHz	Base Bermuda Electric Co.
172.650 MHz	Mobile Bermuda Electric Co.
167.795 MHz	Bermuda Electric Co. (Metermen)
452.900 MHz	Gas Co.
167.370 MHz	Cablevision
168.800 MHz	Cablevision
161.835 MHz	Water Delivery Trucks
166.650 MHz	Water Delivery Trucks
150.820 MHz	Wallington Water Co.

Transportation

168.550 MHz	Public Buses
167.050 MHz	Mini Buses
166.475 MHz	BAS Buses
156.505 MHz	Bermuda Water Tours
166.045 MHz	Bermuda Taxi Co.
168.350 MHz	Bermuda Taxi Owners Association
155.200 MHz	Sandy's Taxi
168.350 / 173.150 MHz	Taxi
166.900 / 171.700 MHz	Taxi
166.600 / 171.400 MHz	Taxi

Local Government

452.575 MHz	Bermuda Governor
155.620 MHz	Public Works
150.820 MHz	Public Works
149.730 MHz	Corporation of Hamilton
151.600 MHz	A Channel Bermuda Regiment
152.650 MHz	B Channel Bermuda Regiment

U.S. Naval Station

141.000 MHz	Administration
138.100 MHz	MPs and Fire Department
130.850 MHz, 140.000 MHz, 140.400 MHz, 140.300 MHz	Misc.

Airport

118.100 MHz	Tower Air Traffic Control
119.100 MHz	Approach
133.300 MHz	Approach (Alternate)
121.700 MHz	Ramp
126.700 MHz	Clearance
126.200 MHz	Clearance (Alternate)
132.200 MHz	Tower
128.500 MHz	Arrival
124.500 MHz	Ground Control
126.900 MHz	Departure
129.900 MHz	Bermuda Radio
169.625 MHz	Civil Aviation Emergency
169.650 MHz	Airport Administration
152.480 MHz	Airport Fire Department
171.450 MHz	Airport Fire Department
169.350 MHz	ASB Ramp Services
169.275 MHz	BAS Trucks
131.140 MHz	American Airlines
130.075 MHz	Eastern Airlines
130.850 MHz	Delta Airlines
131.120 MHz	Air Canada
169.675 MHz	BOAC

Amateur Radio

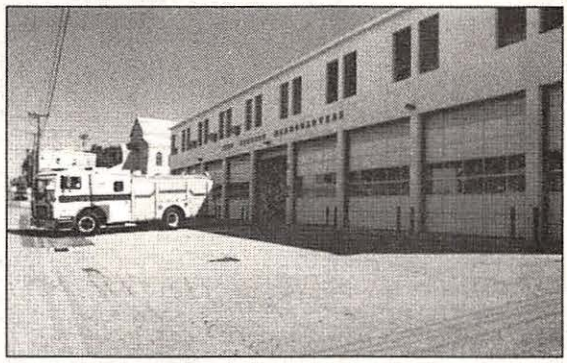
146.340 /146.940 MHz	VP9AX-R Hamilton
146.100 / 146.700 MHz	VP9KA-R Devonshire
146.220 / 146.820 MHz	VP9DC-R Prospect

Marine

156.300 MHz	Channel 6	Ship to Ship
156.350 MHz	Channel 7	Commercial
156.500 MHz	Channel 10	Commercial
156.600 MHz	Channel 12	Port Tugs
156.300 MHz	Channel 13	Harbor Traffic
156.800 MHz	Channel 16	Emergency
156.425 MHz	Channel 68	Harbor Radio / Customs
156.975 MHz	Channel 79	Intra-Ship

Business

452.700 MHz	Dunkeys Dairy
168.900 MHz	Southampton Princess Hotel
165.675 MHz	Island Construction
166.825 MHz	Rogue Construction
168.800 MHz	Bexco
167.370 MHz	D.J.
166.425 MHz	Victor Maiato
166.575 MHz	Trucker Base
166.725 MHz	LLN Butterfield
160.525 MHz	Elbow Beach Hotel
452.575 MHz	Tuzo K-9 Security
453.175 MHz	Swan Trucking
166.665 MHz	S.A.L.
166.205 MHz	Pereric Excavating
167.370 MHz	D.S.J. Construction
166.650 MHz	Maderras Trucking



Facilities of the Bermuda Fire Service Headquarters.

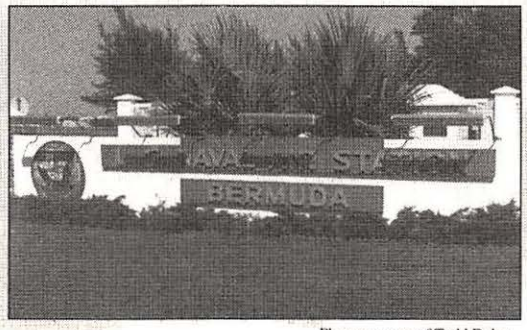
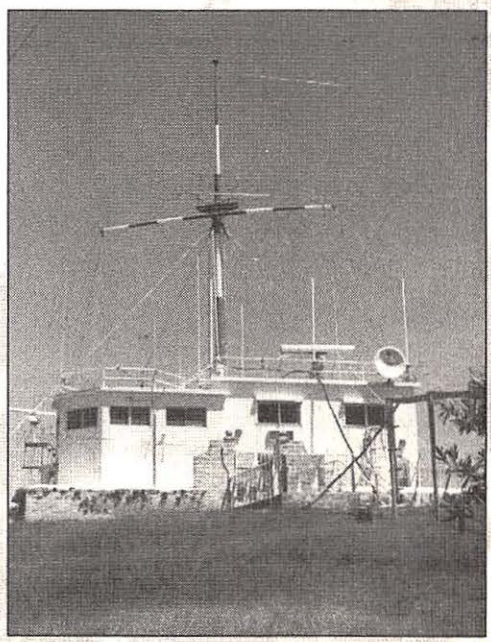


Photo courtesy of Todd Dokey

Monitoring Naval communications out of the Bermuda station can be an interesting pastime.



The antenna farm at Bermuda Harbor Radio.

Photo courtesy of Todd Dokey

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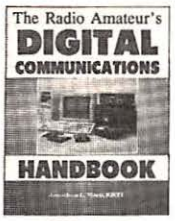

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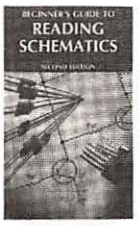

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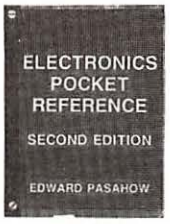

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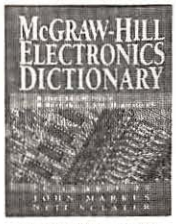

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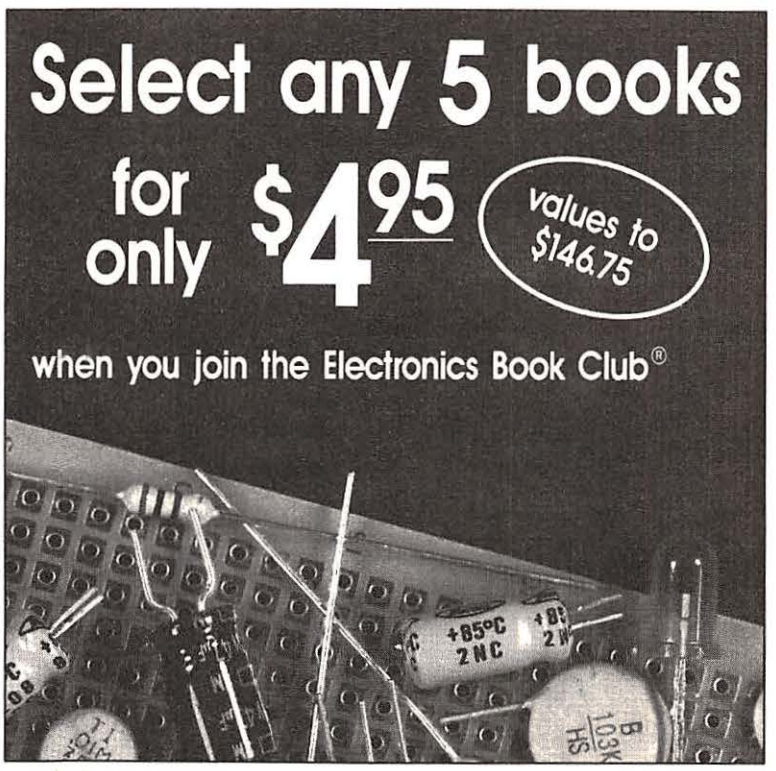

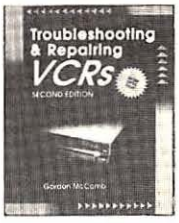

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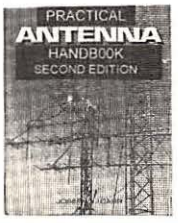

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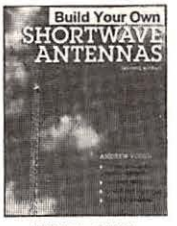

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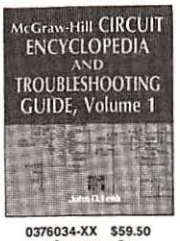

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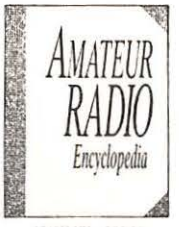

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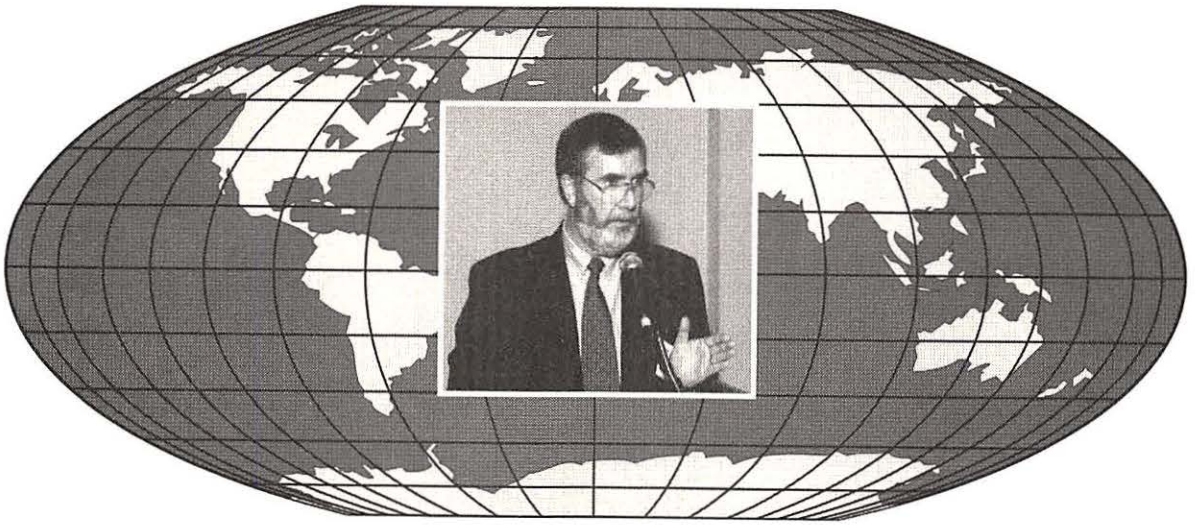

(A View from the Inside)

By Ian McFarland

As *MT* readers will already be aware, the fifth annual *MT* Convention was a real record breaker, attracting several hundred attendees—some from as far afield as Australia, Japan, Germany, and Britain. I would like to think that a couple of "firsts" at this year's fifth annual *MT* convention contributed at least in part to the record attendance: The convention proper was preceded, for the first time ever, by a conference of international broadcasting professionals. As an international broadcaster—albeit a semi-retired one at this point—I was honored to chair both this and the other first time event—an international broadcasting forum, which gave the listeners a chance to put their questions to the broadcasters attending the event.

The one day, international broadcasting conference which preceded the convention proper was attended by a wonderful cross-section of broadcasters: from the struggling to the well-heeled, from the publicly-owned to the private and commercial, from those committed to shortwave to those looking for new solutions. The participants also brought to the conference a cross-section of perspectives: that of engineer, station head, language service head, audience researcher, presenter, owner, and those who provided equipment and services to the broadcasters!

The theme of the conference was "The Future of International Broadcasting on Short Wave"—something which is very much on the minds of broadcasters and listeners alike these days. It seems safe to say that, due to the diverse mix of experiences and circumstances of this modest group, the ensuing discussions could be considered fairly representative of the broad picture of international broadcasting today.

What do the numbers say?

Research data presented by Kim Andrew Elliott of VOA showed that SW audiences in East and Central Europe are decreasing slowly, due to the recent democratization and new Press freedom which have led to considerably more media choices for the general public. In Africa an increasing use of FM radio is also making inroads on the SW audience. In the VOA's case, says Elliott, the increasing use of placement/rebroadcasts have also fragmented the SW audience.

Placement (or rebroadcasts) is when short features or reports from a given SW station are rebroadcast on a local station in a given country. This means of getting information to foreign audiences is currently being used by many international broadcasters. In Eastern Europe, for example, with its diversity of languages, VOA has found that its highest audience levels are found on FM radio, through program placement. For VOA, and presumably for other broadcasters as well, this achieves much higher audience levels for much shorter periods than with SW broadcasts of 30 or 60 minutes duration. However, in the case of English language broadcasts, where the audience is much more geographically diffused (i.e. broadcast to many different parts of the world), SW is still the most effective means of reaching a mass audience.

Simon Spanswick of the BBC World Service confirmed that results of BBC surveys in Eastern Europe largely reflect those of

VOA. Spanswick adds that newly deregulated FM radio in West Africa has really taken off, and the BBC has cashed in on this popularity with an FM outlet in Abidjan, Ivory Coast.

The BBC's use of FM in Abidjan, and the increasing use of program placement by many of the world's international broadcasters is indicative of the current need to reach new and old audiences in new ways, to counteract shrinking SW audiences in many target areas. However, one of the major disadvantages of program placement is that, for the most part, the listener only hears single reports or fragments of programming from any given broadcaster, rather than a full length program. As well, the broadcaster supplying the material usually has far less control over how and when the material is used, compared to a direct broadcast on SW.

Identity and survival

Most of the SW stations in the new democracies of Eastern Europe are probably more concerned these days with trying to overcome the residual effects of many decades of broadcasting propaganda than thinking about things like program placement. Radio Romania, for its part, has recently added three new broadcast languages to its roster, and is considering the addition of a one hour broadcast to North America, as well as additional broadcasts to other target areas.

In the near future Radio Romania will be moving to a new broadcasting centre. Frederica Dochinoiu says that she and her colleagues won't be sorry to see their 42 year old control room equipment replaced.

A constant concern for Radio Romania is the less than acceptable reception of their signal in North America, among other places. As Larry Magne pointed out during the international broadcasting forum, Romania's signal would fare much better with improved frequency management. All too often, Magne says, the problem lies with station executives who don't seem all that interested in improving frequency management. As he also pointed out, this is where the knowledgeable listener can help a great deal, in recommending better frequencies in their reception reports to the less powerful stations.

While Radio Budapest won't be moving to a new building anytime soon, Sandor Laczko reported that his station is looking at a future that will see them staying with traditional SW but also involve some use of satellites. He also emphasized that his station is most interested in constructive feedback from listeners about program content and reception quality. As he says, it doesn't make much sense to put time and effort into programming if it isn't being effectively received by the listeners.

Hi-Tech Alternatives

Figuring very prominently in the concerns of many SWLs over the future of international broadcasting on SW are satellites. To what extent will they be taking over from terrestrial shortwave transmitters, and how soon?

At the moment, that's the big 64,000 dollar question. Unless they happen to own TVRO equipment and do a lot of tuning around the skies, most SWLs are probably unaware of the extent to which satellites are already being used by the domestic broadcasting industry, particularly in North America. Even though satellites are being used as a means of program *distribution* rather than broadcasting, anyone with a dish can pick up the signals. As Ellen Hoff—an expert with 28 years experience in the satellite industry—recounted, there's great growth in the use of satellites by domestic radio stations. One particular satellite is being "looked at" by some 3,000 radio stations, and another by 1,000 stations.

Another largely unknown quantity, as far as its possible effects on the future of international broadcasting on SW are concerned, is the matter of DAB (digital audio broadcasting). This new mode of broadcasting is currently being developed and studied in Europe and Canada, as well as in the U.S.

The DAB system chosen by the four-country European satellite DAB project is the European-developed Eureka 147 system—also adopted in Canada. The Eureka DAB system uses the L-band for both terrestrial and satellite based transmitters. The L-band is the only radio spectrum which has been allocated by the ITU for digital radio transmissions worldwide.

In Canada, DAB will eventually replace the existing AM and FM bands after a transition period of about seven years from the initial startup date, planned for 1995. There would then be one single digital radio band in the 1452-1492 MHz range.

The United States, on the other hand, is heading off in another direction. The NAB, the National Association of Broadcasters, is not at all in favour of DAB, which is seen as a potential threat to existing AM and FM stations. Some broadcasters and entrepreneurs are attempting to develop a digital system which can be used in the existing AM and FM bands. This is known as the IBOC, ("in-band on-channel") solution. The DAB situation in the U.S. is complicated by the fact that at the present time the domestic L-band is not available for use by digital radio.

DABbling in External Broadcasting

There are two current projects that will likely have widespread effects on the use of DAB for international broadcasting. The first of these is a European, direct broadcasting

Superb attendance at the international broadcasting forum which opened the 1994 Monitoring Times Convention in Atlanta, attests to the broad public interest in the state of world broadcasting. The author (shown on previous page) chaired the event.

International Broadcast Conference

Held prior to the 1994 MT Convention in Atlanta

The participants were: Juhani Niinisto, Head of External Broadcasting at YLE-Radio Finland, and Stig-Goran Bergholm, a Liaison Engineer at YLE; Tom Rogers, a member of the board of the International Radio Satellite Corp. in Washington; Ellen Hoff, a satellite expert and Vice-President of W.L. Pritchard & Co., Inc. in Bethesda MD; Kim Andrew Elliott, Audience Research Officer at VOA, Washington; Sandor Laczko, Editor/Presenter at Radio Budapest; Frederica Dochinoiu, Head of English Service at Radio Romania International; Simon Spanswick and Kip Meyers of the BBC World Service in London; Karl Miosga, Managing Director of the World Radio Network in London; Alphonso Montealegre, Producer with the Spanish Service of Radio Netherlands; Robert Stessel and Tony Kobatake, Engineers with the Christian Science Monitor World Service; Jeff and Thais White of Radio Miami International in Florida; and Jerome Bellamy of Geraldine Productions, a newly formed radio production company in France. Also present were Michael Murray, president of the European DX Council, Larry Van Horn, Editor of *Satellite Times,* Gayle Van Horn, *MT* Frequency Manager and columnist, and Rachel Baughn, Editor of *Monitoring Times*, and Ian McFarland.

satellite DAB radio service, being developed by the BBC World Service, Radio France, Deutsche Welle and Radio Netherlands.

The second is an international DBS digital radio project which groups Radio Japan, Radio Australia, Channel Africa, Radio France International, Deutsche Welle, Radio Netherlands, Radio Canada International, the BBC World Service, and the VOA. Also involved are the European Broadcasting Union, the Asia-Pacific Broadcasting Union, future service providers and market researchers. The project was launched at a meeting in London in January 1994. While many of the details of the project have still to be worked out, engineering trials will be carried out starting in April 1995, using the INMARSAT satellite.

While there are no DAB receivers available on the market as yet, it's hoped that these can be produced at a retail cost of around 100 U.S. dollars. If the European DAB radio project is successful, this will undoubtedly hasten the development of DAB receivers, which could also be used to pick up international broadcasting. Since there will be a transition period of some years, the DAB receivers to be developed will have to be able to receive existing AM and FM signals as well as the new DAB signals. The more countries which use the same DAB system and standards, the lower receiver costs are likely to be.

Once DAB becomes established for domestic purposes in North America, Europe and elsewhere, it should be a relatively simple matter for international broadcasting to take advantage of the new medium, especially when direct broadcasting satellites are used .... At least, that's what I thought, in my slightly naive enthusiasm for an exciting new future for international broadcasting.

However, as satellite expert Ellen Hoff pointed out, it's not a hand-in-glove match. Most of the domestic stations that will ultimately be on DAB via satellite will likely be local stations, just as they are now on AM and FM. These local stations will require spot beams—relatively small satellite footprints—to cover just a single city and its suburbs. International broadcasting, on the other hand, requires much larger satellite footprints—large enough to cover whole countries, or even several countries.

■ *A Bird in the Hand ...*

On the other hand, you can get international broadcasting by satellite today — no waiting! The pioneering, London-based World Radio Network has assembled a roster of some 20 international broadcasting stations in a 24 hour English service which can be heard via the MTV subcarrier on the Galaxy 5 satellite in North America. It's also heard via the direct broadcasting Astra satellite in Europe.

While this service has also been downlinked into some cable TV and radio services in North America, it's questionable whether the audience via TVRO systems will ever amount to much. This potential audience for international broadcasting is also being affected by local bylaws in many parts of the U.S. and Canada, not to mention similar laws in countries which have banned satellite dishes.

During the broadcasting forum, Larry Magne made the point that the C-Span cable TV service in the U.S. has already been carrying a selection of SW stations on its two audio networks for a number of years now, but the listenership is still extremely low. Is it reasonable to expect their presence on satellite will add a significant increase?

A quick poll of the forum audience of some 200 avid radio monitoring enthusiasts would appear to back up Magne's claim. A show of hands indicated that less than ten percent of the audience owned satellite receiving equipment, with even fewer who were thinking about getting the equipment. Could it be that the vast majority of the people who own satellite equipment have a mindset that precludes associating international radio with television satellites?

Continued on Page 18

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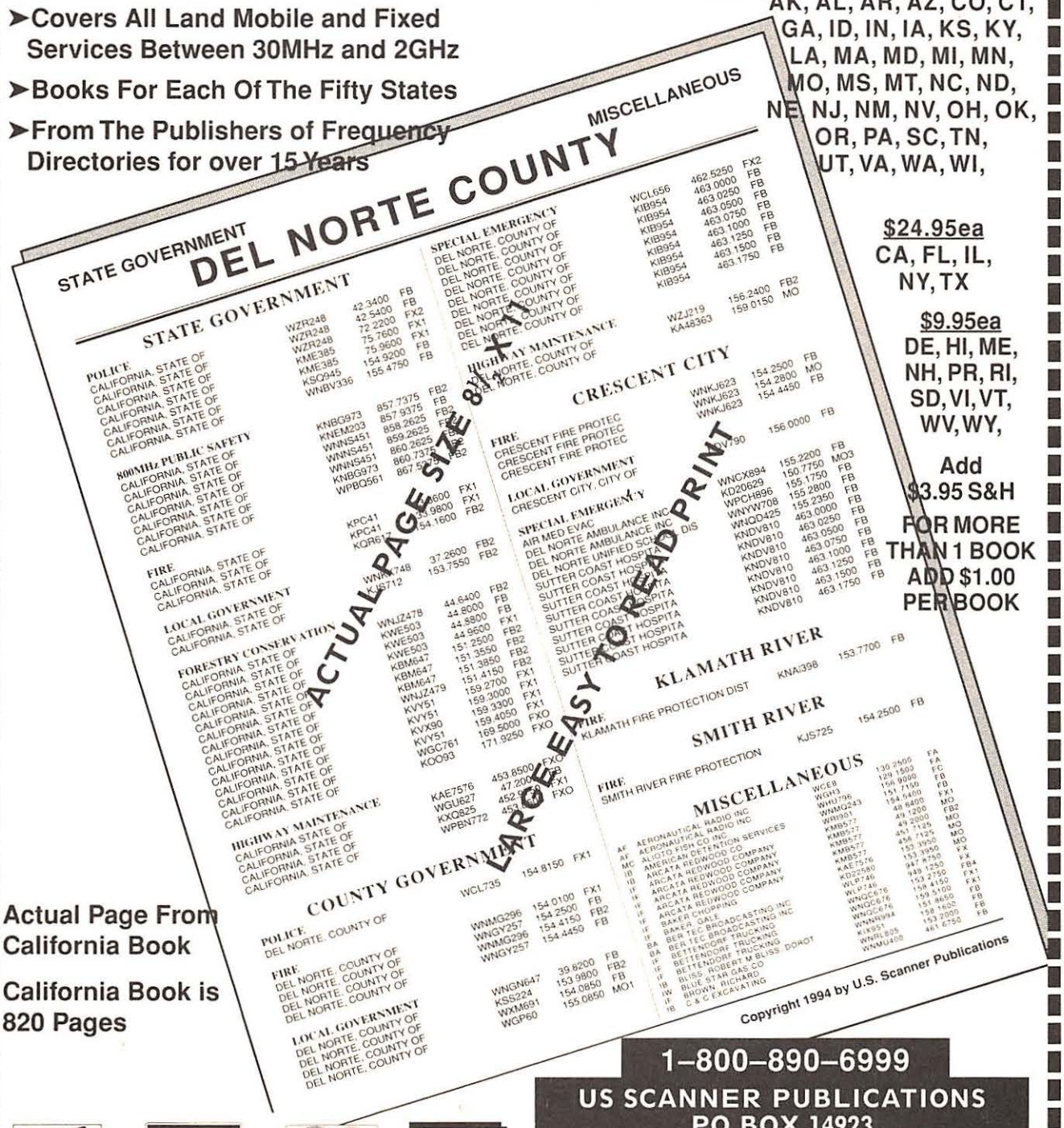

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There is widespread agreement amongst broadcasters generally, that shortwave still has at least a couple of decades of useful life left for international broadcasting. Over those decades, though, life will be a very mixed bag of transmission modes. Of one thing we can be fairly certain: one of those transmission modes won't be single sideband. SSB for international broadcasting is pretty well a dead issue now, having been superseded by better technology.

Shortwave Today

During the Friday evening international broadcasting forum—the event which kicked off the 5th annual Monitoring Times Convention—the audience didn't seem overly concerned with a doom and gloom attitude about the future of international broadcasting on shortwave. The wide ranging questions fielded by the panel of broadcasters indicated more concern over the present state of international broadcasting.

One questioner wondered just what the role of the international broadcaster is. It was pointed out that the role of the public broadcasters differs a great deal from that of the private commercial stations. Kim Andrew Elliott of the VOA felt that the role of any given broadcaster must be determined by the needs of the listeners. The successful stations, he said, were the ones who determined these needs and tried to fill them.

Elliott's opinion was supported by Larry Magne, who observed that since he started including station addresses in *Passport to World Band Radio* stations have reported an increase in letters from listeners, commenting about what they like and dislike about the programming.

Speaking for the private commercial shortwave broadcasters, WWCR's George McClintock disagreed strongly over the role of listeners in programming decisions. He said that with very few exceptions it's the people that pay the bills who set the station's goals and objectives, and determine what will be heard on the air. While that may or may not be true, I would certainly question the wisdom of any commercial shortwave broadcaster who chooses to ignore several hundred or more letters from listeners who were complaining about some particular aspect of the station's programming.

During a discussion about the interference caused by all the high powered transmitters in use on shortwave today, Jeff White, the General Manager and moving force behind Radio Miami International—one of the newest commercial shortwave stations in the U.S.—brought out an interesting aspect of the power spiral. His original intention when setting up WRMI was to use only a ten kilowatt transmitter. He felt that this would be adequate to get a good signal into his intended target area of the Caribbean basin. However, the FCC regulations decree that minimum transmitter power is fifty kW into an antenna with a minimum gain of ten dB. So, that's what he's using.

Cutting Back and Cutting Corners

In answer to a questioner's concern over the effects of budget cuts to international broadcasting worldwide, Larry Magne pointed out that while these cuts do have an impact on the quality and quantity of some of what's being heard these days, the language services most affected tend to be the secondary languages of any given station, and not the broadcasts in English.

One particular comment by George McClintock elicited an emotional response from one avid listener in the forum audience. McClintock mentioned that it would be nice to see the shortwave receiver market rid of all those cheap radios selling for fifty dollars or less, and which do not give even half decent performance. The sooner the better. The audience member felt that this was a rather arrogant attitude, pointing out that these cheap radios are all that listeners in the developing countries can afford, and without them they simply wouldn't have anything to listen on.

While this is certainly a valid view, the original point, which may have suffered somewhat from a lack of elaboration, was really that these inexpensive radios should perform much better than they do. It was also pointed out by the panel that when shortwave receiver sales boomed in North America during the Gulf War and demand outstripped the supply of decent receivers in the stores, these cheap receivers were all that were still available. They performed so badly that many thou-

sands of people turned away from shortwave listening once the war was over.

It was suggested this problem could be offset by increasing the visibility of quality receivers through well-placed, well-designed publicity by the manufacturers (such as is being done by Grundig), along with more widespread consumer reports on shortwave receivers.

And speaking of receiver sales and audiences, another questioner wondered how the shortwave receiver market in the US was being affected by the increasing number of private commercial shortwave stations in the US. Larry Magne reported noting a growth trend in SWLing in North America even before the boom in US stations on shortwave. However, the new stations are having a definite impact on receiver sales because of the wide range of viewpoints and opinions that are being aired on these stations.

Some interesting figures from Grundig served to support Magne's view: In 1993, in North America, Grundig's shortwave receiver sales were up by over forty percent. In the first nine months of 1994, sales were up over one hundred percent.

So, What Can We Expect?

If there is a bottom line to all this uncertainty about where international broadcasting is headed—both on and off shortwave—it is that the use of shortwave is by no means dead, nor is its demise imminent, contrary to some reports. A company like TDF, which is the carrier for Radio France International, would not likely be spending many millions of dollars on state of the art transmitters and antennas if the death of shortwave were just around the corner.

There is widespread agreement amongst broadcasters generally, that shortwave still has at least a couple of decades of useful life left for international broadcasting. Over those decades, though, life will be a very mixed bag of transmission modes. Of one thing we can be fairly certain: one of those transmission modes won't be single sideband. SSB for international broadcasting is pretty well a dead issue now, having been superseded by better technology.

Personally, I tend to think that it will likely be the bigger stations—those now operating the 250 kW and 500 kW transmitters—which will be the initial users of satellites to replace shortwave. If that happens, I also think that listening and DXing on the shortwave bands will be a great deal more enjoyable with all of the high powered transmitters gone.

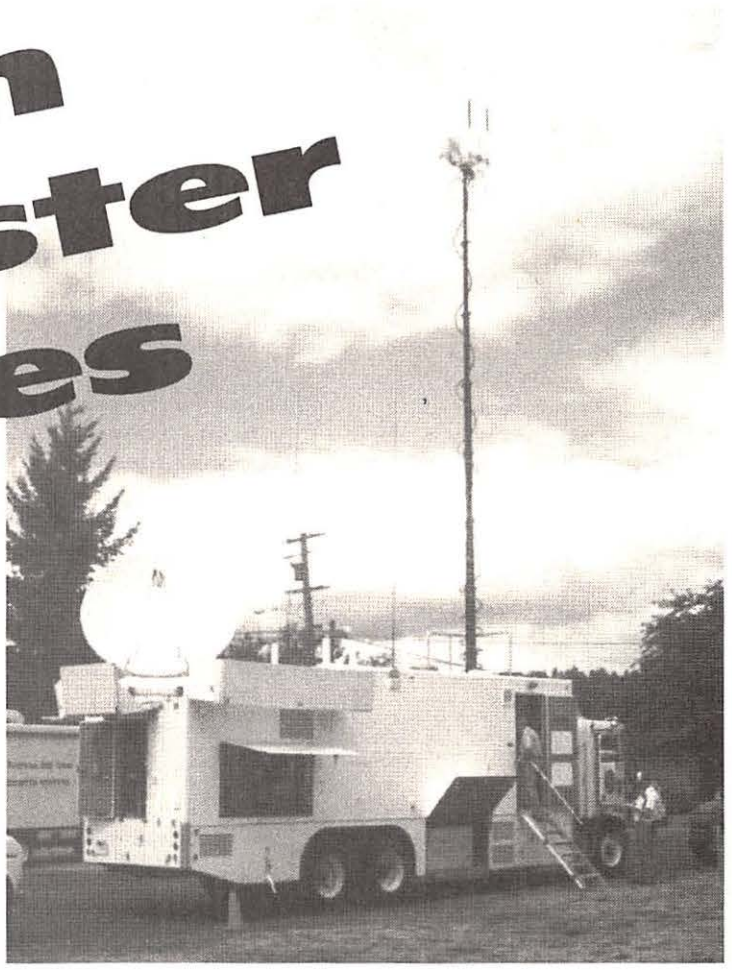
As one who has had a close and most enjoyable association with the shortwave hobby community for some 25 years now, I must confess to feeling like a bit of a heretic when speaking or writing about the future of shortwave. I know that what attracts many listeners to international broadcasting on the shortwave bands is the exotic nature of the experience, as well as the challenge of tuning in to radio from all those far off places. As a broadcaster though, I would much rather that the listener be able to hear my programs with the best possible clarity of reception. While you may not hang on my every word, I would at least like you to be able to hear each word clearly and without interference.

It will probably be a long time yet, if ever, before we see everyone abandon shortwave in favour of satellites. Until that day comes, shortwave listeners will at least have a better chance to hear a host of stations that have had to fight so long and hard to be heard amid the din of international broadcasting's ever-increasing power spiral.

Now, if we could only do something about that !@#$* sunspot cycle ... !

When Disaster Strikes

Ask for the MRV From FEMA



Outside view of MRV, with satcom dish antenna and LOS pneumatic mast raised, and HF whips unhooked.

Story by Bob Morehouse, KB7ADO

Photos by Bob Morehouse & Dean Zeirman

The logo on the door has a phrase: "PACE AC BELLO MERITA." It is Latin for "Service During Peace and War" and it is the creed of the Federal Emergency Management Agency (FEMA). I hope you never have to see one of their rigs in action, because that means you are somewhere most people don't want to be: in or near a disaster.

Multiple Radio Vans (referred to as MRVs) are operated by FEMA Mobile Emergency Response Support (MERS) Detachments. Their mission is to provide communications, and help with information processing, logistics, and operational support to federal, state, and local agencies during times of natural and technological disasters.

We all know how important it is to establish and maintain the lines of communication during emergency situations. Frequently there is a loss (or absence) of commercial power, as well as downed telephone lines and radio towers, or the emergency occurs in a remote area where these items are not present. When normal methods of communication are disrupted, overloaded, or unavailable, the MRV is just what you need to fill in the blanks. FEMA defines it as "a single, self-contained vehicle providing a wide range of communications capability; from single sideband HF through state-of-the-art satellite telephone and broadcast video."

There are currently five MRVs, located at MERS offices in Colorado, Georgia, Texas, Massachusetts, and Washington. They are constructed on a Kenworth chassis, are 13' 4" tall (with rooftop antennas lowered and secured), have a gross vehicle weight of 45,000 lbs., and are 44 ft. long. All in all, it's a pretty big vehicle.

They are manufactured by Wolf Coach of Auburn, Massachusetts, with the systems designed by CTA, Inc., also in Auburn. The price? Well, it's not necessarily a secret, but in these days where the public frequently complains about government spending, FEMA representatives prefer not to quote exact amounts. With the constant upgrades and additions to the MRV's capabilities, the figures change frequently anyway. I have heard estimates of at least $2 million.

Although it is capable of traveling on all semi-improved roadways (it has a dual rear locking axle), there are occasions when time is critical. In those cases, they drive to the nearest air base to be loaded into a C-5 cargo jet. (No, I'm afraid it won't quite fit into a C-141.) There have been times the Bothell, Washington, crew have been on the way with their MRV to McChord Air Force Base in Tacoma to catch a flight, only to be cancelled

TABLE 1: *MRV Radios 7 Spectrum of Coverage*

Type of Radio	Frequency Range
2 HF	1.6-30 MHz
2 VHF	29.5-90 & 130-174 MHz
2 VHF/AIR	116-150 & 225-400 MHz
1 LMR VHF Low	136-162 MHz
1 LMR VHF High	146-174 MHz
2 VHF/UHF	130-173, 406-420, & 440-470 MHz
2 LMR UHF Mid	450-482 MHz
2 LMR UHF High	482-512 MHz
1 UHF Satcom	116-150 & 225-400 MHz
1 UHF Trunking	806-870 MHz

while en route. That happened fairly recently, when a hurricane was threatening to swat Hawaii and then turned another direction.

■ *Name Your Communications Need: The MRV Can Meet It*

And now, the radio section. The MRV has almost uninterrupted access to the radio spectrum from 1.6 to 512 MHz and 806-870 MHz, and can transmit AM, SSB, CW, FM, and various data modes. It is capable of secure voice transmission using DES, DES-XL, DVP, and DVP-XL. The RF output varies per frequency range and radio, but it can run from 1 to 500 watts. There are no fewer than 16 radios in this vehicle (see Table1), as well as a cellular phone, handheld, and man-pack units. Oh, yes: they also have a Global Positioning System receiver with a cab roof-mounted antenna.

A very obvious feature is the high-powered, Ku-band satellite communications (satcom) system, with the large roof-mounted 2.4 meter dish, which can bring in 24 telephone trunk lines via satellite into ravaged areas which may have no landline communications at all. These lines are uplinked into the satellites from Virginia, so signals originating from the MRV are actually long distance calls, even though the place they're calling could be just over the hill.

One "bird" commonly used in the western U.S. is Telstar 401, which is located far enough to the west to allow access from Hawaii. Callers wanting to reach someone through the MRV do so via toll-free 800 numbers. If the MRV crew needs to set up other equipment, the command ground station in Virginia can remotely control the console in the MRV to increase transmit power until levels are acceptable. A computer terminal tells them which satellites are available in their area.

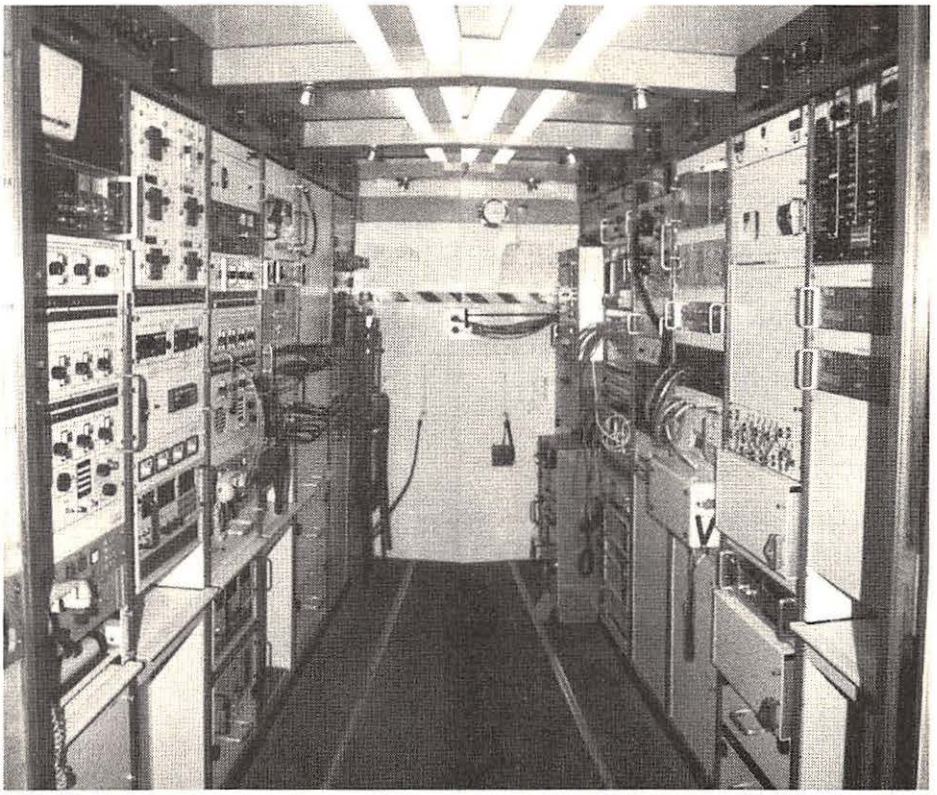
The satcom antenna installation was very nicely done. Doors open on the roof to allow the dish to be raised from its protective hiding spot and remotely pointed at the chosen "ear-in-the-sky." Hydraulic leveling "feet" beneath the MRV give the vehicle stability and help reduce movement so the dish can more easily lock onto the satellite's signal. A new feature just added in the past year allows both digital and analog video broadcast and receive capabilities. This allows the MRV to send images of the disaster area back to our elected officials, downlink CNN, or tie into a local cable channel to transmit assistance information to disaster area residents.

A variety of HF, VHF, and UHF antennas also sprout from the roof. There are several long HF whips which can be hooked down during travel. Another prominent feature is a 42-foot pneumatic mast with a small dish (and optionally, a pair of narrow beam antennas) for linking into a nearby telephone central office (or remoting other signals to or from the vehicle) to bring in another 24 trunk lines.

This is part of the Line Of Sight (LOS) Wideband/Microwave system. These trunks can then be connected to the Merlin Legend Portable Switch telephone system, and extend subscriber telephones to up to 60 extensions. (The technicians I recently spoke with indicated it is very rare for all of the telephone uplinks to be in use at the same time.)

The Bothell MRV was in Pasadena last summer to provide "comm" support for some Olympic-style games. This required short-notice equipment additions to cover the UHF-T- band spectrum, as the frequency congestion in that area of California has required reassignment of part of the unused UHF television band for two-way radio use. The number of users and their close proximity to each other also called for the remote, field-deployable antenna setups as well. California is believed to be the only area in the West using these frequencies, but now the MRV has several programmable mobile units to handle this range, also.

Of course, we can't imagine how much radio traffic really goes on following disasters. You can bet there's a lot, within a potentially small area. That lends itself to the possibility of a high degree of interference be-



A bit of photo trickery allows us to show both sides of the MRV's innards at once. At left are tape decks, HF, VHF, UHF, marine and aircraft radios, as well as the PL tone selectors. The area at right has satcom equipment, breakers, and various other control panels.

tween users. Another convenient feature of the MRV is that it's RF-tight (and EMP protected) when the doors are closed. The radio section of the vehicle was constructed in a "screen room"—a shielded structure commonly used in the commercial two-way radio repair field to eliminate stray radio signals. Add to that the ability to place the previously mentioned remote antennas some distance from the vehicle, and that can further reduce potential intermod. Somebody was thinking ahead when they designed this unit.

Have Radio, Will Travel

Employment with this agency most certainly requires the ability to be ready to go anywhere with very short notice. Some of the more notable destinations the MRV crews have gone to include Southern California, Kauai, Florida, San Francisco, and the Columbia River Gorge in 1Oregon.

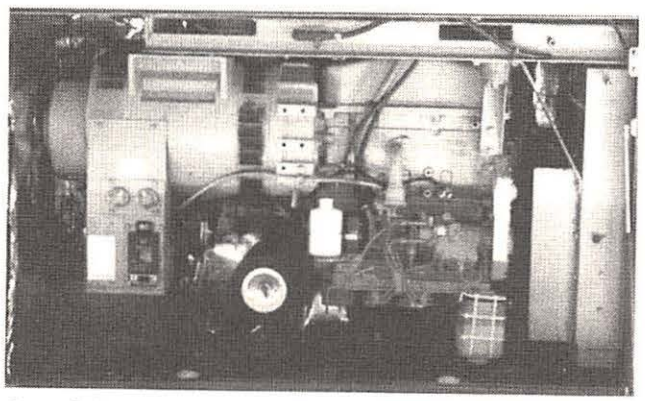
Lest it sound like the crews were hitting the popular vacation spots, be assured that conditions under which they visited weren't particularly enticing or desirable. The residents of Northridge and the San Francisco Bay Area can assure you that picking up after an earthquake is not fun. After the Southern California earthquake of early 1994, three MRVs were sent for comm support in the San Fernando Valley area. The only reason there weren't more was that the other two were in Virginia being fitted with the satellite video capabilities.

Southern Florida and the "Garden Isle" of Kauai were not the pleasant places they normally are, either, following attacks by Hurricanes Andrew and Iniki. And the beauty of the Columbia River Gorge is difficult to appreciate with the smoke and haze of forest fires obscuring the horizon. Crews are frequently placed on "standby" for potential short-notice responses to floods, fires, tropical storms, and other incidents we read about in the paper daily.

These guys love their jobs, though, because they're doing something to help the people of these stricken regions. While the rest of the world sits in their living room and watches scenes of the damaged areas on CNN, these highly-trained, dedicated individuals are actually there doing something to make things a little better.

Not surprisingly, several members of each team are qualified radio technicians, as the MRV has testing and repair facilities on board for every radio it carries. Fortunately, there is a very, very small turnover rate within these positions, as the orientation and constant training requirements are significant, as you can imagine.

So what else makes this vehicle more than just a big truck with a lot of radios? Well, how about the ability to crosslink to or from any radio the MRV has on board, including the satellite telephone channels? Imagine having to have only one handheld radio at a disaster site. Suppose you're the fire battalion chief and you want to talk to the highway patrol command post, or maybe you need to make a call to the National Hurricane Center. Well, just call the MRV and they'll "patch you through." In fact, there was a case last year at a forest fire scene in Oregon where a highway road crew found a rock slide across an active rail line. The MRV crew determined the area's main rail "road" channel and cross-banded the highway crew leader into that frequency. Imagine the train engineer's surprise when he finally figured out who he was talking to! They got the train stopped just about 2 miles before the slide.



One of the 27-kilowatt generators.

Recently the MRV and a crew from the Bothell office returned from one of the large forest fire sites in the eastern part of the Oregon, near Wenatchee, where its cross-band linking capability was very popular. Many different agencies were involved in those blazes, as there were volunteers responding from all over the Pacific Northwest lending a hand at trying to snuff out these costly fires.

Another very valuable feature is the MRV's ability to playback or record disaster site communications. There are two studio-quality cassette tape recorders dedicated to this function.

Of course, it's also very convenient to have the 200-gallon diesel fuel tank on board, especially when you need to run one of the two 27-kilowatt generators (which are alternated every 12 hours), or any of the six Environmental Control Units (ECUs), which are designed for use between -40 to +135 degrees Fahrenheit. There's also a front-mounted, heavy-duty winch with 10,000/20,000 lb. load capacity.

The MRV can also operate "on the move." There are "captains chairs" (with seat belts) which can be placed in the aisle between the consoles for times when the vehicle is going down the highway.

You may be wondering, "Where do I listen for an MRV if it's in my area?" Well, they're likely to pop up anywhere on the spectrum. It will depend on who they are supporting. They may come up on fire frequencies, police networks, or local disaster preparedness channels. They do, of course, have portable radios for crew communications in and around the MRV. One federal frequency guide shows several channels in the 139 MHz range that could be used for this.

To many of us, radio is primarily a recreational hobby which we from time to time have occasion to use in a positive manner, such as reporting accidents or drunk drivers, supporting bicycle races, or search and rescue activities. For the men and women of the Federal Emergency Management Agency—and in this case, the MERS Detachments and MRV operators—it goes far beyond that. I thank them for their dedication and willingness to go anywhere, anytime, to do whatever they can whenever Mother Nature gives us a "wake up" call.

My thanks to Dave, Gerald, Mark, Dean, Kurt, Hal, and everyone at the Bothell MERS for their help in providing technical data, informative stories, and photo assistance for this article.

RADIO WITH A PAST

Can Radio Argentina Legitimately Claim To Be the World's First Radio Station?

By Don Moore

Is it Latin America or is it Europe? In the case of Argentina, it's hard to tell. Except for a few frontier regions, Argentina seems more like Europe than Latin America. It wasn't always this way, but around the turn of the century when the U.S. and Canada were receiving waves of European immigrants, so was Argentina. Nearly half were Italian, but other large groups came from Spain, England, Russia, Poland, Wales, and Yugoslavia, among other countries. In 1914, thirty percent of Argentina's population was foreign born, and the immigrants changed the character of the country, its food, and its language.

Why did the immigrants come? As in North America, this was a land of opportunity. Beef and grain exports from the Argentine pampas to Europe had created a strong economy. But with one million square miles of area (the world's 8th largest country) there was still land to settle, and there were growing industrial metropolises such as Rosario, Cordoba, and, of course, Buenos Aires.

Argentina was (and is) an educated nation. Since the 1880s, the literacy rate has been 90% or more, for years better than many European countries. Argentina was democratic with regular elections. As in North America, all these factors spelled prosperity, and in the 1930s Argentina's GNP was on level with Western Europe. Buenos Aires was even the third city in the world to build a subway, after London and Boston!

World's First Station?

Argentine professors and inventors began experimenting with radio shortly after Marconi's first successes were announced, and ship-to-shore, amateur radio, and similar services developed quickly. And although we here in the U.S. lie snug in our claim that Pittsburgh's KDKA was the world's first broadcasting station, Argentina has a different tale to tell. Argentine broadcasting began with a group of young entrepreneurs and the Sociedad Radio Argentina in downtown Buenos Aires' Teatro Coliseo on August 27, 1920, nearly ten weeks before KDKA. An empty room housed the homemade equipment, and the antenna was simply a wire strung between the theater and a nearby

house. At precisely 9 pm, the transmitters were turned on, and after a short announcement the station commenced with a live performance of Richard Wagner's opera *Parsifal* from the theater below.

Only about 20 families in Buenos Aires were known to have receivers, so the audience couldn't have been that great, but the next day a local newspaper commented that anyone hearing the broadcast would have thought "those divine notes had come down from heaven." Radio Argentina continued nightly broadcasts of live theater fare, eventually expanding the schedule and moving into recorded programming as well.

Why isn't Radio Argentina considered to be the world's first radio station? After all, like KDKA, Radio Argentina went on the air solely to broadcast entertainment programs to the general public and it maintained a daily schedule from the very first day. While there are other stations that claim to predate KDKA, those either had very irregular schedules or were amateur or utility stations that did entertainment broadcasting on the side.

The lack of recognition for Radio Argentina is probably in part because Latin America is so often ignored in U.S. and European history books, and in part because Radio Argentina wasn't licensed. While KDKA obtained a license from the U.S. government before going on the air, the Argentine government didn't have any licensing procedures until 1923, when Radio Argentina was granted the fist license on November 19. Does Radio Argentina deserve a share of KDKA's glory? It depends on how important that piece of paper is.

Radio Argentina had the Argentine airwaves to itself until the 1922 opening of Radio Cultura, which claims to be the first station in the world to air commercial advertising (although the author hasn't found any specific support for this). Other stations quickly followed, and by 1925 there were a dozen in Buenos Aires and ten more in interior cities. Broadcasting continued to grow and the 1930s were a golden age of quality live entertainment on Argentine radio, as three networks developed, headed by Radio El Mundo, Radio Splendid, and Radio Belgrano.

Formerly on shortwave, Radio El Mundo is one of several stations that Evita Perón once worked for.

Politics Steps In

The complete freedom that Argentine broadcasting enjoyed in its early years changed in 1943. For years an Argentine Fascist movement had been building in the military among admirers of Hitler, Mussolini, and Franco. Many officers felt that Argentina, too, could be a stronger nation with a totalitarian military government guiding the way. On June 4, 1943, a key group of colonels acted by seizing all media facilities and other key points in Buenos Aires. General Pedro P. Ramirez was named the new president, but the real power was in the hands of the colonels' junta.

Latin America has had more than its share of military dictatorships, but until this point, rarely had there been more than haphazard, light censorship of the press. But the colonels planned to turn Argentina's media into a propaganda machine, as had been done in Germany, Italy, and Spain. Ten days after the coup, the government announced that all radio broadcasts had to be scripted in advance and passed by a government censor. No deviation from scripts or impromptu broadcasting would be permitted.

Furthermore, stations were forbidden to relay shortwave newscasts from the U.S., Canada, and Britain and were forced to relay newscasts from the Axis powers. On the other hand, the junta gave Argentine culture a boost by mandating that all stations carry a minimum percentage of Argentine music. That the junta was serious was demonstrated just a few days later when Luis Sandrini, a popular comedian on Radio Belgrano, deviated from a script and joked that President Ramirez's initials PPR stood for "presidente por un rato," (president for a short while.) Hours later, Sandrini was on a plane heading to exile in Mexico.

The colonels consolidated their power and divided their responsibilities, and in October one of the group, Juan Perón, was appointed to head the National Labor Department, an unimportant position where he was expected to wither away, leaving more power for the others. Perón, however, had other plans. When urban industrialization came to Argentina, the Argentine workers found them-

selves powerless and taken advantage of, as they were in North America and Europe. But labor unions and government regulations had never gained enough force to better the lives of Argentina's working class.

Perón saw the opportunity and put together a revolutionary program of social benefits for Argentina's urban workers, including paid vacations, pensions, child labor laws, and accident compensation. On December 2, 1943, he spoke on national radio, outlining his plans and promising a better Argentina. Radio had never seriously been used for political purposes in Argentina before, but Perón's dynamic speaking ability and his golden promises created an immediate power base for him.

Roger Atwood (left) and Tony Middleton (right) during a live airing of RAE's English broadcast. Atwood is no longer at RAE, but Middleton is now the director of the English section.

At least one of Perón's new fans was not a poor factory worker, but one of the country's most popular entertainers, Evita Duarte. Born to a poor provincial family, Evita ran away to Buenos Aires at the age of thirteen to become an actress. Although just 20 years old, by 1939 she was the co-director of Argentina's leading radionovela (soap opera) production company, producing dramas for Radio El Mundo and Radio Belgrano. A few months after Perón's speech she arranged to meet him "accidentally" while he was inspecting damage in a provincial earthquake. They left the quake arm-and-arm and moved in together soon after that, creating quite a scandal among the upper crust, but admiration among working class soap opera fans.

While Evita may have used sex appeal to snag Perón, she had a sharp mind for politics and knew how to use power. Together, she and Perón would become unstoppable.

As Perón's popularity grew, the other colonels grew uneasy and in October 1945 quietly arrested Perón and jailed him on a remote island. But the macho officers hadn't bothered with Evita. After all, what could a woman do? On October 17, Evita proved that she could be just as dynamic a political orator as Perón. In a fiery speech on Radio Belgrano, she reminded the factory workers of everything that Perón had done for them and called for their help in freeing Perón and making him president. Hours later as 200,000 workers converged on the presidential palace, the junta announced that Perón would be released and that presidential elections would be held in February, 1946. Perón's most vocal opponents on the junta resigned, and those remaining joined his bandwagon. Of course it wouldn't do for a presidential candidate to be living in sin, so Eva and Juan were married a few weeks later.

Perón had no intention of losing the election, and opposition candidates found themselves banned from buying advertising on radios or billboards and from renting halls for rallies. The U.S. embassy tried to throw some covert support to Perón's opponents, but this was exposed and backfired, winning more voters for Perón. Still, Perón squeaked by with just 54%.

Perón followed through on his promises to the workers, and this, combined with a strong market for Argentine goods in devastated postwar Europe, kept Perón popular. But, it was obvious to any observer that the Fascism that had just been defeated in Italy and Germany had taken root in Argentina. And unlike the junta before him, Perón would not be content to simply intimidate the media. Starting with Radio Belgrano, the licenses of various stations and networks were declared to be expired, and ownership passed to Perón's cronies. In short order the radio industry, while nominally independent of the government, was for all purposes its propaganda mouthpiece.

Together, Eva and Juan Perón were a glamorous couple—the symbol of the new Argentina that Perón had promised. Evita even made the cover of *Time* magazine. Perón continued to use live radio speeches and film clips shown in theaters to whip his followers into a frenzy. Eva's abilities as a political speaker and organizer were equal to Perón's and with her radio background, Eva kept a close eye on the entertainment media. Any actors, actresses, writers, or others who dared to criticize the government were exiled or jailed.

Perón Broadcasts to the World

While similar governments in Spain and Portugal kept their politics to themselves and became Western allies in the fight against Communism, Perón's flamboyant style and eagerness to export his politics made him an international political wildcard. And, what better way is there to export politics than via international broadcasting on shortwave?

Early in April 1949, Perón's government announced that a "Voice of Argentina" would soon take to the airwaves. Broadcasts were to begin on May 1, International Labor Day, but Perón couldn't wait. On April 11, he and Evita opened the station themselves with live speeches. The station's purpose, Perón said, was "to report honestly the results of our hard battle for a better country and for a humanity closer to its essential duties, (and the station would) arrive with legitimate accent, direct, speaking to others as if we were speaking among ourselves."

The initial schedule consisted of broadcasts in Spanish, English, Portuguese, Italian, and French, including seven hours to Brazil, four to the USA, and two to England, daily. The station made enough of an impact that it was even featured in several *New York Times* articles. But, despite promises of being unbiased, it was a propaganda machine, pure and simple.

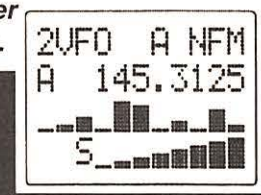
When it seemed as if Perón and Evita would go on forever, everything came to a crashing halt. In 1951 Evita became ill with uterine cancer and died in July 1952. One half of the team was gone, and Perón lost spirit and direction. Meanwhile, rebuilding in Europe meant less demand for Argentine goods and a slumping economy. In 1955, civilian riots and a military uprising forced Perón into exile in Spain. For the next 38 years, Argentina alternated between repressive military dictatorships and ineffective civilian governments. Perón was allowed to return to Argentina in the 1970s, and was promptly reelected president. But he was nearly eighty and did very little before dying in office a few months later.

The next period of dictatorship was the most repressive of all, as thousands of government opponents were kidnapped, tortured, and murdered. Exiled former propagandists from German Nazi radio were even placed in

Continued on Page 28

AOR THE NEW CONCEPT AR8000 RECEIVER

AOR has broken the mold of conventional radio receiver design! The AR8000 is a new breed of receiver, combining full computer compatibility with advanced wide-band receiver technology. The opening welcome message on the AR8000's multi-function liquid crystal display "WELCOME TO THE WORLD OF AR8000 RECEIVER", immediately deomonstrates to the new user and discerning radio listener that the AR8000 is no ordinary radio , but THE NEW CONCEPT in radio design.



- Wide coverage 500kHz to 1900MHz continuous*
- Programmable tuning steps (minimum 50 kHz)
- All-mode reception AM, USB LSB CW, NFM, WFM
- True carrier re-insertion for USB, LSB, & CW
- Separate 2.4kHz SSB filter
- 1000 memory channels (50ch x 20 banks)
- SCAN/SEARCH speed of 30 channels per second
- Comprehensive SCAN methods standard (i.e. Delay Scan, Audio Scan, Free etc.)
- Wide variety of SEARCH methods (i.e. Delay Search, Audio Search• etc.
- Simultaneous Dual VFO display
- NEWUSER and EXPERT configurations
- Connection for computer control
- Spectrum type display for band occupancy (BANDSCOPE)*
- Dot-matrix type LCD which will allow alphanumeric display
- Supplied with helical antenna, NiCads & wall charger.

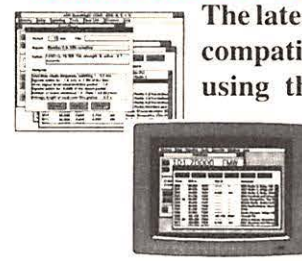
* *Les cellular/Pending FCC approval*

AR3000A

Widest coverage on the market today with a high level of performance and versatility from long wave thru short-wave, VHF and onward to the upper limits of UHF and VHF! Uses 15 band pass filters before the GaAsFET RF amplifiers unlike other receivers which may rely largely on broad band amplifiers. High sensitivity through the entire coverage with outstanding dynamic range and freedom from inter-modulation effects.

Frequency: 100kHz-2036MHz Continuous*
Mode: USB, LSB, CW, AM, FMN, FMW
Circuitry: Triple (USB/LSB/CW/AM/FMN) and Quadruple (FMW) conversion superheterodyne **Memories:** 400 (4 banks/100 channels)
Scan Rate: 50 ch/sec. **Search Rate:** 50 steps/sec
Sensitivity(μV): 2.5-1800MHz CW, SSB .25/AM1.0/FMN .35/FMW 3.0
Selectivity: SSB,CW 2.4kHz/ AM,FMN 12kHz FMW 180kHz
Power: 13.8VDC, <.5A max audio, AC adapt. incl.
Size: 5.5"W x 3.5"H x 7.9"D; 2.6 lbs.
* *Less cellular*

AOR SEARCHLIGHT WINDOWS SOFTWARE for the AR3000A



The latest AOR software for IBM and compatible control of the AR3000A, using the computer's RS232 serial port. DEMO disk available at your dealer for $10.00 (Save towards the purchase of the full program.)

FEATURES: **•Microsoft Windows Program** -foreground and background **•On-line help** - *Windows* hypertext provides info you need, also dialogues have "help" function **•Fully supported *Windows* Sound Recording** -Correctly configured compatible sound card allows recording from your receiver while scanning or analyzing frequencies. A log contains all the recordings for replay. **•Unlimited number of disk based memory banks** -Each memory banks contains 400 memory channels and can be uploaded or downloaded to and from the receiver. Up to 10 banks may be viewed on-screen at once and an unlimited number may be stored to disk (restricted by your space). **•Copy date to & from clipboard** - Bulk editing and export data base (not supplied) or other *Windows* applications. **•Memory scan and Programmable Band Scan** -Provides a histogram display showing the activity of each channel. Full control is provided including a cursor indicator and sound recording (optional).

AR3030 HF HI TECH RECEIVER

•Direct Digital Synthesizer with Numeric Controlled OSC improves carrier to noise ratio drastically •10Hz tuning accuracy; RIT control CW/SSB •Synchro detector improves AM signals under severe fading conditions •Tuning via keyboard or knob •Carrier Operated Relay for remote start/stop of recorder when signal is present •TCXO ; not an option 5PPM (-5°F+130°F) Wide dynamic range, Double Balance Mixer in 1st mixer, over 100dB, with higher intercept point than other receivers in this class • AGC control w/ off position • Large backlit LCD • Analog S meter •Dual VFO increases flexibility •RS-232C serial interface for opt. comp control • 3 way power source: AC adpt., 13.8VDC, internal 8AA NiCad or dry cell required • Processed aluminum case and chassis • 2 year factory authorized U.S. warranty.

Frequency: 30kHz-30MHz opt. int. VHF conv. 108-174MHz
Memories: 100 programmable w/ scan
Modes: AM, LSB, USB,CW, FAX, FMN

Tuning Accuracy: 10Hz
Power: 12VDC -800mA(max.); 8AA Nicad or Alk (not incl.)
Size: 10"W x 3.5"H x 9.5"D; 4.8 lbs. CALL your dealer for Product brochure!

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charge of programming at government stations. Then, in a desperate attempt to regain popular support, the dictators launched the disastrous Falklands/Malvinas War with Great Britain. Embarrassed by the loss, the military was forced to return to the barracks, and civilian government returned in 1983.

Even so, from 1943 to 1983, world economic developments and government mismanagement caused Argentina to slip to the verge of Third World status. As Argentines put it, "We don't know if we're the poorest of the rich, or the richest of the poor." But, almost miraculously, democracy has once again taken hold in Argentina and the economy is stronger than it has been in decades. Argentina seems ready for another golden age.

A Visit to RAE

Although the governments after Perón didn't have the interest in international propaganda that he had, the external service has continued, attached to the Radio Nacional domestic network. A few years ago, my wife and I were in Buenos Aires and visited Radio Nacional and RAE (Radiodiffusion Argentina al Exterior), as the foreign service is now known. They are located about a mile from downtown Buenos Aires in a huge old mansion, complete with chandeliers, ornate woodwork, and painted ceilings, that had been donated to the government. Unfortunately, the antique grace of the building is decaying, and Radio Nacional can't afford the twenty servants that the previous owners had to keep the house going!

The heart of Radio Nacional and RAE is the central control room from which the several program services, either live or on tape, are sent out to the transmitters. The equipment is very old, some of it dating back to Perón's time. "Welcome to radio's prehistory," one technician joked. Outside the window, the base of Radio Nacional's FM tower fills what had once been a small enclosed garden behind the house.

The external service is housed in one mid-sized room filled with tables and chairs and a file drawer for each language department. Postcards and maps sent by listeners cover the walls, and scripts and listeners' letters clutter the tables. With the entire staff working in one room, it can be a very busy place with discussions in several languages at the same time.

Like many smaller international services, the announcers have little opportunity for creativity here. The news and most programming is scripted in Spanish in the central Radio Nacional office and then sent to the language sections to be translated before going on the air. Even the music selections are picked in advance.

Of course it is difficult to translate and still maintain the style and flow of the original script, which is why many international broadcasters, such as RAE, sound a bit stiff and artificial. Occasionally the English sections sometimes fudges a bit on translating certain news items and reads the related article out of daily English language *Buenos Aires Herald* instead. The only chance the announcers have to create their own programming is during the mailbag features, since each language section reads and answers its own mail.

We met several of the staff members, including Tony Middleton, the current director of the English section. Tony is an Argentine of British parentage who has worked at RAE since 1980. On the side he does bit parts in Argentine movies and acts in local TV commercials. In 1985, he had a small part in Argentina's Academy Award winning *La Historia Oficial*. Tony invited us to sit in on the live broadcast to Europe at 1800. Yes, *live*. The English broadcast goes out live to Europe and is recorded for later repeat to North America.

The RAE studio, where all external programs are recorded, is actually an unconnected room opening on to a balcony overlooking the central patio and its huge antenna. To enter the studio, one has to walk through the adjacent control room, out onto the patio, and then into the studio. The room is large, and the table, chairs, and microphone for the announcers only takes up one side of it. Along another wall is an old sofa and easy chair—perfect places for guests to sit.

All told, the old mansion is a perfect location for RAE and Radio Nacional. Its decaying grandeur symbolizes Argentina's past greatness, but looking around at the mansion's wonders, one can't help but see possibilities. Just maybe, the best is yet to come.

Downtown Buenos Aires, in all of its modernity.

Tuning in RAE's external service is, of course, the best way to hear Argentina. Check *MT*'s Shortwave Guide for the latest English schedule. In addition, Radio Nacional's domestic service is often heard on 6060 kHz around 0900 UTC, as can the provincial station Radio Nacional Mendoza on 6180, which is usually parallel.

As Argentina is in the southern hemisphere, these stations are easier to hear in the (North American) summer than in the winter. The only other Argentine station heard in North America recently is small Radio Malargue 6160.6 kHz, when it sometimes manages to squeeze by the Canadian stations on 6160 around 1000 UTC. Finally, some Argentine stations, such as Radio Rivadavia and Radio Continental, can sometimes be heard on USB on out-of-band frequencies, usually with sports programming. These are special relays for Argentine military forces in Tierra del Fuego and Antarctica.

But, more shortwave from Argentina may be on the way. Several of Argentina's major private stations—Radio El Mundo, Radio Splendid, and Radio Belgrano—used shortwave for decades until the military government prohibited private shortwave broadcasting in the early 1980s. The civilian government has lifted the ban, and Radio Belgrano and Radio El Mundo are reportedly planning a return to shortwave.

By Benjamin D. Meyer

You say you like to listen to shortwave to keep up with late-breaking world events? Well, you're not alone. Uncle Sam always has his "ears on" when it comes to monitoring foreign radio broadcasts. Since 1940, 24 hours a day, 365 days a year, the Foreign Broadcast Service (FBIS) has monitored radio broadcast transmissions throughout the world.

Today they also monitor television, RTTY, FAX, and satellite transponders. The FBIS also subscribes to foreign newspapers, magazines, and periodicals.

What do they do with all this information? The FBIS is an agency of the U.S. Intelligence Community. In fact, it falls under the Directorate of Science and Technology of the Central Intelligence Agency. Its mission is to monitor, select, process, translate, edit, analyze, and disseminate information in the foreign media to detect and evaluate trends so that Uncle Sam doesn't get surprised with his "pants down" concerning world events. All foreign print and broadcast information includes some potential intelligence value if you know what to look for.

S H H H H H !

The F.B.I.S. is Listening!

Based on its intercepts of articles in the electronic and print media, the FBIS publishes daily reports and other specialized publications concerning what is happening in foreign countries and geographic areas. One of the report categories, for example, is Science and Technology. A typical science and technology report may address recent developments in the People's Republic of China. Because all of this information is compiled from overt (open) sources, you can subscribe to these reports if you're interested.

In addition to providing reports to the public, the FBIS also distributes reports to other government agencies. Many of them receive "soft" copy via computer to speed things up rather than waiting for the printed version.

Of interest to FBIS and its customers are public speeches by world leaders. It's not uncommon for the FBIS to process speeches by long-winded foreign dignitaries in several "takes." Some of these speeches can go on for hours. The first part of the speech may have already been captured and translated into English while the speech is still being given. In that way the FBIS helps Uncle Sam to stay on top of rapidly-changing world events.

It's not uncommon for the FBIS to often "scoop" the domestic

What does it mean when Castro rubs his nose? The Phantom—that is, the FBIS—knows. The agency falls under the authority of the CIA (facilities shown at right) for its worldwide information-gathering services. Much of what it gleans is also available to the public—at a cost.

networks and wire services on a fast-breaking story. This is due, in large part, to the FBIS continuously monitoring a geographical area. In this way they are "on the spot" when a story breaks. They may have been able to see it coming days or weeks in advance.

Worldwide Sources

Although based in Northern Virginia, the FBIS has bureaus throughout the world. Bureaus vary in size according to the quantity of information they process.

Bureaus are staffed by foreign nationals sensitive to the cultural nuances of the area. Because much of the information is provided in a foreign language for domestic consumption, an accurate translation into english is imperative. When reporting on television programs, it's no easy task to describe the body language of the people involved and the background. The English translation must be completely objective without adding or deleting information to preserve the original meaning of the source broadcast.

It's no secret what is going on; the host countries know full well that the FBIS is there and what it is doing. Indeed, the BBC does much the same thing, and *Monitoring Times* subscribes to their monitoring service. For places where the U.S. isn't welcome, like Cuba, the FBIS listens in from Southern Florida.

Many FBIS monitors hold subscriptions to *MT* primarily for the monthly English Language Shortwave Guide and propagation conditions. These monitors often "cruise" the radio spectrum using their Watkins Johnson Receivers, just like we do, to discover clandestine transmissions.

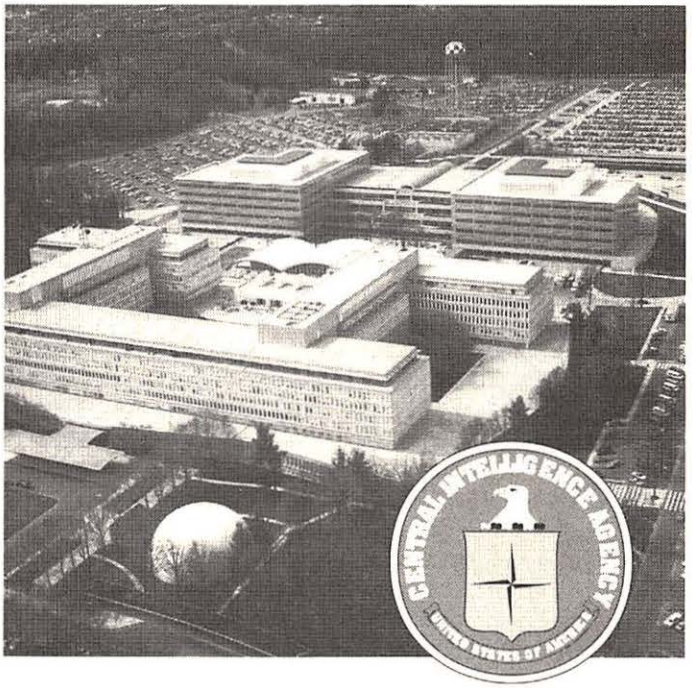
There are situations where an FBIS Bureau is physically located in one country but monitors a wide geographic area. Remotely controlled receivers connected to land lines are sometimes used in this situation. Luckily, radio and TV transmissions ignore political boundaries.

Monitors type their translations into PCs and the files are then transmitted to FBIS Headquarters in Virginia. There the articles are edited and included in FBIS publications and routed to other government agencies.

Information is Power

What's all the fuss about—everything is open-source, right? Well, yes and no. Articles and broadcasts selected for translation and transmission back to the U.S. represent a critical information pipeline for national policy makers and intelligence analysts.

Print media are monitored as closely as broadcast media by the FBIS.



FBIS analysts also review the incoming information. These analysts are experts in specific disciplines and have established profiles on world leaders and events. They sift through the collected information and draw conclusions about things like what it means when Fidel Castro rubs his nose.

The analysts prepare reports based on their opinions. Because these reports are based on the opinions of government analysts, they are therefore highly classified and remain within government circles. In this manner the FBIS puts critical facts into the hands of policymakers.

The FBIS just completed a major modernization program that transitioned it from a paperwork operation—largely unchanged for decades—to a modern, high-speed, computerized information gathering system. This state-of-the-art technology has enabled FBIS to increase both the quantity and the speed of the information processed, as well as improving the accessibility and dissemination of a huge quantity of information.

People from several disciplines are involved in the effort, including language officers, editors, analysts, communication specialists, database managers, experts in automated database search and retrieval, and maintenance technicians.

Does the FBIS monitor Saddam Hussian's cellular telephone? If they do, they aren't talking.

If you are interested in subscribing to the Foreign Broadcast Information Service Daily Reports or the less-frequent Joint Publications Research Service (JPRS), call National Technical Information Service (703) 487-4650 (U.S. Dept of Commerce, 5285 Port Royal Road, Springfield, VA 22161. The NTIS and the Government Printing Office (202-707-3238) also make many CIA publications and maps available to the public. Call for current pricing.

Larry Van Horn, N5FPW

Going, Going, and Soon to be Gone!

For years now, I have watched as a large number of HF networks have moved from shortwave and on to satellites to improve their communications capability. Systems such as point-to-point, press relay, weather information stations, and military communications represent just a few of the services that have abandoned HF either partially or totally over the last three decades. One notable HF digital system hasn't completely moved to satellites, but that is about to change.

The Aeronautical Fixed Telecommunications Network (AFTN) has provided the RTTY enthusiast with some great listening targets in Africa in the past, but it looks like these stations will follow the trend and move to satellite in 1995. Many AFTN North American and European stations have already moved to satellite.

What is left of the AFTN on HF will use digital modes to pass messages related to the safety of air navigation and the regular, efficient, and economical operation of air services. These messages are in a coded format and are usually decoded by a computer at the receiving station. Listeners equipped with a digital mode decoder will find the *Air and Meteo Code Manual* by Jorge Klingenfuss invaluable in decoding these transmissions.

Most of the transmissions you will receive from these stations will utilize RTTY (Radioteletype), but some stations also use both the ARQ-M2 and ARQ-E3 digital transmissions modes. The bulk of the traffic sent on these networks are flight plans and you will find that a lot of the traffic will be concentrated around the top of the hour and half hour.

Each RTTY circuit is intended for one way communications between two stations. The stations transmit a circuit identifier which is used to identify both the sending and receiving stations, as well as the number of circuits available between them. Many circuits are arranged in pairs.

Since the majority of the stations remaining on the air are located in Africa, monitors along the East Coast of the United States should check for these stations in the late afternoon and early evening. Unfortunately, listeners on the West Coast have reported little success in receiving these African stations.

Most of the AFTN stations have more than one frequency allocated, and you should follow the general rule that the higher frequencies will be used during their local daytime with a shift to lower ones as night approaches. Table One is a comprehensive list of AFTN stations and frequencies.

DCS Mystery Solved?

For years, a series of military tactical stations have intrigued me and made me wonder to what system they belong. These stations use single word tactical callsigns and they always seemed to be setting up FDM (Frequency Domain Multiplex or MUX) networks. Voice seems to be used only as means to coordinate the setup of these long distance data connections.

I now believe I have the answer to this mystery in the form of a Department of Defense (DoD) system known as the Defense Communications System (DCS) HF long haul network.

TABLE 1: *Aeronautical Fixed Stations*

Call	Station/Location	Mode	Frequencies
----	Larnaca, Cyprus	RTTY	8137.0
3BZ	Plaisance, Mauritius	ARQ-E3	4023.5 7763.5 9195.0 9378.5
3XA	Conakry, Guinea	RTTY	3710.8 7610.0 10104.0 18388.7
5AF	Tripoli, Libya	RTTY	2822.0 11494.5 18388.6 19822.5
5HD	Dar-es-Salaam, Tanzania	RTTY	7990.0 11175.8
5NK	Kano, Kenya	RTTY	7342.0 7817.5 11440.0
5NL	Lagos, Nigeria	RTTY	7426.0 9105.0 10391.0
5ST	Antananarivo, Madagascar	ARQ-E3	4014.7 7834.7 9194.9
5TX	Nouadhibou, Mauritania	ARQ-E3	6943.0
5UA	Niamey, Nigeria	ARQ-M2	5159.7 7596.0 7614.0
	RTTY	4846.0	5610.5 8031.0 9160.0 9848.0 11575.0 14937.5
5YD	Nairobi, Kenya	RTTY	7423.0 8161.5 8165.0 11546.0 12256.0 13367.1 13372.5 13737.0
6VU	Dakar, Senegal	RTTY	3650.0 4788.0 6975.0 7483.0 7618.0 9070.0 10047.0 10407.0
7OC	Khormaksar, Yemen	RTTY	5879.0 6765.7 7340.0 11005.0 11056.0 11541.0 11640.0 14395.0
7QZ	Lilongwe, Mali	RTTY	8137.7
8BN	Medan, Indonesia	RTTY	6925.0
8Q9	Maldeve, Maldives	RTTY	6989.0
9GC	Accra, Ghana	RTTY	5804.0 5904.1 7832.0
9HA	Luqa, Malta	RTTY	2682.0 3595.0 5364.0 5818.5 7797.0 9228.0 19958.0
9JZ	Lusaka, Zambia	RTTY	7913.0 8118.5 11443.0
9PL	Kinshasa, Zaire	RTTY	9058.0 11027.5 14786.5 18363.5
9UA	Bujumbura, Burundi	RTTY	14633.0
ARA	Karachi, Pakistan	RTTY	14458.0
AWC	Calcutta, India	RTTY	3177.5
AWD	Delhi, India	RTTY	8071.3
CA17E	Easter Island	RTTY	8819.0 13200.0
CAK	Santiago, Chile (AF)	RTTY	11100.0
CSY	Santa Maria, Azores	RTTY	5474.0 6999.0 9994.2 10539.1 11668.5 12323.0 14497.5
D4B	Sal Island, Cape Verde	RTTY	9154.0 14508.0
DJR	Djibouti, Djibouti	RTTY	5334.0
EIP	Shannon, Ireland	RTTY	8145.0 11440.0
ELRB	Monrovia, Liberia	RTTY	5393.5 9252.0
EPD	Tehran, Iran	RTTY	5107.0 12065.0
ETD3	Addis Ababa, Ethiopia	RTTY	5187.0 6736.0 6912.0 9873.5 10779.0 11112.8 12174.5 18924.8
FBSK	Gaborone, Botswana	RTTY	5287.2
HSD	Bangkok, Thailand	RTTY	3886.2 4014.0 10654.3 13742.5
HZJ	Jeddah, Saudi Arabia	RTTY	3999.0 5733.0 13752.0 14370.5
STK	Khartoum, Sudan	RTTY	3602.5 5117.0 6784.0 7803.5 8101.0 9437.7 11507.5 11634.5 13991.5 13996.5 16202.0 18064.5 18165.0 18173.5 18543.5
SUC	Cairo, Egypt	RTTY	4960.0 10633.0 14498.0 14631.0 14776.0
S2D	Dhaka, Bangladesh	RTTY	6882.5 10613.0 15655.0
TJK	Doula, Cameroon	ARQ-E3	4056.0
		ARQ-M2	7714.0
		RTTY	4788.0 9136.0 9223.5 9226.0 11676.5
TLO	Bangui, Central Africa Rep	RTTY	6902.5 9072.5 9183.7
TNL	Brazzaville, Congo	RTTY	4870.0 7474.0 8113.0 8146.0 9285.0 10123.0 14462.5 14722.5 14989.0
		ARQ-M2	3898.0 4487.5 8123.0 9285.0 14490.0 14890.0 14989.0
TRK	Libreville, Gabon	ARQ-E3	4464.5
		ARQ-M2	6941.3 12072.7
TTL	N'Djamena, Chad	ARQ-M2	9217.5
		RTTY	7630.0 12263.0 18047.0
TUH	Adibjan, Cote d'Ivoire	RTTY	4195.5 5487.7 5848.0 7690.0 9144.0 9423.0 9846.0 11486.0
TYE	Cotonou, Benin	ARQ-M2	5117.7 (Also RTTY) 7524.0
TZH	Bamako, Mali	RTTY	5503.0 7355.3 7626.0 10134.0 11515.2
XTU	Ouagadougou, Burkina Faso	ARQ-M2	6775.0
XZW	Tangon, Myanmar	RTTY	4015.0 7419.0
YAV	Kabul, Afghanistan	RTTY	5266.0 11065.0

According to a yearly report issued by the National Communications System (NCS), a portion of the Defense Communications System uses a system of HF long haul point-to-point links to pass data traffic. Over the last couple of years, satellite and fiber optic cable have started to replace elements of the DCS HF system. In 1993 seven of these links were under review and six were disestablished. These links were in the U.S. European Command (USEUCOM) and U.S. Atlantic Command (USCINCLANT) areas. During 1994 a review of HF links in the Pacific was to be conducted.

One of the callsigns long thought to be a part of this system originates out of Andrews AFB, Maryland — callsign Acrobat. The table below lists some intercepts and callsigns that possibly relate to HF DCS activity.

4555.0	Vesper/Thunder discussing switchboards (USB/LSB)
4751.5	Crazy Weed Alpha working Romeo, Missionary, and Brother 1. Due to power failure voice communications only, no secure comms (USB)
4845.0	Billboard calling Mellow (LSB)
6753.0	USAF Acrobat working Butter, QSY from 6830.0 (LSB)
6830.0	USAF Acrobat working Butter, QSY to 6753.0 (LSB)
6909.0	Dictionary working unidentified station closing xmission (LSB)
6910.0	USAF Yoglund calling Acrobat, said transmit on Echo 3, receive on Echo 2 (LSB)
6989.0	Durant working Bomber asking about status after outage (USB)
7425.0	Missionary working Butter 9 (LSB)
7921.0	USAF Gold Bloom calling Acrobat on channel Alpha 7 (USB)
8041.0	Missionary calling unidentified station (LSB) Durant working Kilgore for message status report (USB)
9190.1	USAF Acquire working Acrobat, QSY Mike 3, mentioned Mike 4 (LSB)
10648.0	Best Judge working Missionary setting up long haul data circuit then FDM noted (LSB)
10665.0	Missionary working Global on duplex setting up FDM net (USB)
10905.0	USAF Acrobat calling Zulu (LSB)
11410.0	Durant working Gold Bloom Alpha on duplex setup (LSB) This is Alpha 4 channel. Goldbloom working Durant (LSB)
11535.0	Cassity working Echo, mention KL-43 transmission (USB) India working Iron Grip (USB). Missionary working Butter (USB)
12056.5	USAF Day Letter attempting to contact Acrobat (LSB)
16090.0	Missionary calling Awaken, told to QSY to 2 Lima (USB)
17460.0	Durant working unidentified station in duplex, QSY to Bravo 7 (LSB)

If anyone has an update or information on the DoD DCS HF networks, please pass it along to P.O. Box 98, Brasstown, NC 28902.

Nightwatch Update

It has been confirmed that our listings for the USSTRATCOM Nightwatch network we published in the October 1994 Utility World column was fairly accurate. Based on some additional information that has been forwarded to this column, I do have one update to one of the callsigns mentioned in that column.

The listing for **Nightwatch 04** is not a NEACP aircraft as previously thought. It should read US Pacific TACAMO aircraft (E-6) Command Post. In light of the amount of activity I have seen reported, and the location of our reporters looking into this system, a Pacific based command post does fit the profile for this callsign.

Speaking of the NEACP aircraft, Wright-Patterson AFB, Ohio, has been chosen as a new part-time home for the USAF E-4B aircraft. In mid-November, "Wright-Patt" became a new forward operating base for the E-4B aircraft, which are permanently based at Offutt Air Force Base in Omaha, Nebraska. One Air Force official said that the aircraft will spend about two days a week at the base.

Since the cold war is over, these aircraft haven't had a lot to do and the Air Force is still trying to hold on to them by finding new missions for these flying communication platforms to perform. In the last four months the Air Force has literally opened the doors for the public and the media to look inside these former top secret aircraft. It costs about $50 million a year to operate the four E-4B aircraft that were built between 1973 and 1975. One has to wonder if this newfound openness is a tactic to try and keep these cold war dinosaurs flying. Known as the NEACP aircraft for years, the *new* U.S. Air Force acronym for the E-4Bs is NAOC or **National Airborne Operations Center**. Informally, the aircraft had been nicknamed the "Doomsday Planes."

Although it was designed to protect national security in the event of a nuclear attack, the aircraft will now be used in cases of natural disasters. Federal officials decided about four months ago to use the planes to aid communities who are besieged by earthquakes, hurricanes, tornadoes, and other disasters.

The aircraft is capable of housing the President and 90 others for up to 72 hours in the air. President Clinton has not yet boarded one of the aircrafts, but former Presidents Nixon, Carter, Reagan, and Bush have all flown in the NAOC.

One Air Force official said, "There is nothing like this in the world that has the communications capabilities. From the air, we can monitor and communicate with any military unit or civilian outlet in the world." So when the next disaster hits, you might just be able to catch one of these flying comm platforms working the boys at FEMA. Be sure to let us know what you hear. Thanks to Mike Schulsinger for the info on the E-4B move to Wright-Patterson.

COMINT Book released

Tom Roach and I finally had a few minutes to talk at this year's *MT* convention in Atlanta and he gave me a copy of his new book, *Hobbyist's Guide to COMINT Collection and Analysis*.

This book was written so that anyone with the inclination to do so can engage in the esoteric and "hush hush" art of communications intelligence or COMINT.

For many people there exists a strong fascination with listening to or reading another person's or country's private communications. You will be surprised to discover the degree of success a hobbyist can expect to achieve by a personal intercept and analysis operation of the sort described in this book. Utility enthusiasts certainly encounter private communications: some personal, some administrative, and some diplomatic. It is the analysis of these types of communications, as the author points out, that will allow the listener to lift the veil of secrecy surrounding a lot of HF communications we receive.

You may be surprised at some of the messages you can receive. In his remarkable study, *Soviet Naval Power in the Pacific*, Derek Da Cunha quotes an Australian MP:

> "...supposed non-military [Russian] fishing vessels have been logged sending messages in highly complex codes, far more complex than warranted by a report on fish tonnage caught."

The author has personally intercepted many of these messages, which the Russians refer to as "KRIPTOGRAMMA." Between the covers of this book are the details on exactly how to snoop sensitive, but easily accessible, communications. The communications you can monitor range from top level diplomatic communications between a government and its embassies, messages to and from spies, cellular telephones, and "baby monitors."

This is an excellent book that provides a keen insight into the world of COMINT. Governments do it — why not the hobbyist? Tom Roach has produced an excellent book and it deserves a spot on your book shelf if you want to peek inside the world of communications intelligence.

This book is available from several *MT* advertisers and retails for $19.95.

Utility Loggings

UTILITY WORLD

Larry Van Horn

Abbreviations used in this column

ACC	Air Combat Command	LDOC	Long Distance Operational Control
AFB	Air Force Base		
AM	Amplitude Modulation	Meteo	Meteorological
ATC	Air Traffic Control	MFA	Ministry of Foreign Affairs
AWACS	Airborne Warning and Control System	PTT	Post & Telegraph Administration
CG	Coast Guard	RAF	Royal Air Force
Comms	Communications	RTTY	Radioteletype
COMSTA	Communications Station	SAM	Special Air Mission
CW	Continuous Wave (Morse Code)	SAR	Search and Rescue
		SATCOM	Satellite Communications
EAM	Emergency Action Message	SITOR-A	Simplex teleprinting over radio system, mode A
Fax	Facsimile		
GHFS	Global HF System	U.S.	United States
HF	High Frequency	USAF	U.S. Air Force
ID	Indentification	USB	Upper Sideband
JTF4	Joint Task Force—Caribbean Drug Interdiction	USCG	U.S. Coast Guard

All frequencies in kilohertz (kHz), all times in UTC. All voice transmissions in English unless otherwise noted.

111.3 Warsaw Meteo with coded weather (Finland) 50 baud RTTY at 1813. (Robin Hood-UK)

2702.0 Royal Navy Coastal Control working Coastal Air in USB at 2223. (Ary Boender-Netherlands)

2869.0 Continental 2 working San Francisco ATC in USB at 0455. (Gordon Levine-Anaheim, CA)

3250.0 EIAA Shannon Air Radio with ID and RY tape in 50 baud RTTY at 0721. (Hood-UK)

3253.0 NODH-*USCG Cutter Bittersweet* (WLB-389) working Group Woods Hole in USB at 0235 regarding HFDL. (Rich Baker-OH)

4360.0 SYN-Israeli Mossad station in USB at 2130. (Boender-Neth)

4460.0 FTJ-Israeli Mossad station with 5 letter groups in USB at 2000. (Boedner-Neth)

4560.0 YHF-Israeli Mossad station with 5 letter groups in USB at 2130. (Boender-Neth)

4576.0 V-Single Letter CW marker in CW at 0003. (Boender-Neth)

4665.0 VLB-Israeli Mossad number station in USB at 2045. (Boender-Neth)

4725.0 Reach 114 working MacDill GHFS in USB at 1830. (Fowler-MA)

4880.0 ULX-Israeli Mossad number station in USB at 2200. (Boender-Neth)

5001.0 4XZ-Haifa Naval Radio, Israel, with CW ID at 0425. (M. Hardester-NC)

5230.0 KPA-Israeli Mossad number station in USB at 2018. (Boender-Neth)

5262.0 HEP-Interpol Zurich, Switzerland, with CW V marker at 1205. (Boender-Neth)

5277.0 Panther, US Customs facility in Bahamas at 0230 calling 32C in USB. At 0251, USCG COMSTA New Orleans, LA, calling CG 6027. (Baker-OH) *DEA channel Alpha-Larry.*

5333.5 US Navy FT net noted here in USB at 2325. (Fowler-MA)

5400.0 NMR1-GANTSEC (USCG Greater Antilles Section, San Juan, PR) working R7R at 0029 in USB, switched to 3E7. (Baker-OH)

5410.0 Spanish language, Mexican Army of Guadalajara talking to Jalisco about the men who didn't show up for work and giving their names in USB at 1448. (J. Leyden-Long Beach, CA)

5541.0 Air France 6750 working Stockholm Radio (LDOC) in USB at 1858. (Hood-UK)

5547.0 Continental 83 working San Francisco ATC in USB at 0402. (Gerald Brookman-Kenai, AK)

5598.0 New York ATC working various civilian and military aircraft from 0520-0642. (Levine-CA)

5658.0 Air France 469 working Addis Ababa ATC in USB at 2148. (Hood-UK)

5604.0 Ascot 2061 working Rainbow Radio (LDOC) with phone patch to RAF Brize Norton, UK, in USB at 0722. (Hood-UK)

5634.0 Speedbird 115 working Bombay ATC in USB at 2109. (Hood-UK)

5665.0 Japan Air 613 working Hong Komg ATC in USB at 1834. (Brookman-AK)

5680.0 Q8B (female operator) periodically on frequency broadcasting the EAMs being broadcast on 8967 during exercise in USB at 0215. (Jeff Haverlah-Houston, TX)

5745.0 USCG Kodiak, AK, working Narrow Cape Loran station in USB at 0032. (Brookman-AK)

6224.0 Unknown experimental station KA2XTH at 1950 in USB working KA2XTI attempting to setup 2400 baud video. Heard later on 8297.0 doing the same. (Baker-OH)

6340.0 NMF-USCG Boston, MA, with fax weather charts at various times. (Carl F. Hattan-Melbourne, FL)

6513.0 VFF-Canadian Coast Guard, NWT, with marine weather, notices to shipping in English and French in USB at 0210. (Rausch-NJ)

6532.0 Honolulu ATC working Japan Air 50 Zulu in USB at 1326. (Levine-CA)

6586.0 New York ATC working Aeroflot 346 and UPS 2014 in USB at 0524. (Levine-CA)

6655.0 Tokyo and Honolulu ATC working various aircraft at 1308 in USB. (Levine-CA)

6673.0 San Francisco ATC working American 128 in USB at 1501. (Levine-CA)

6714.0 Rescue operations, unidentified USAF rescue squadron at 1513 in USB working Jolly 13/15 (USAF aerospace rescue service heavy-lift helo not on a SAR) with radio checks at various altitudes and distance from base. (Baker-OH)

6730.0 SAM 974 and Air Force Two working Andrews in USB at 0145. (Janet Whitney-Alexandria, VA)

6731.0 Air Force One working Andrews in USB at 2335. (Derick W. Ovenall-Wilmington, DE)

6735.0 Bravo Whiskey working FT net in USB at 1733. Various Jake ## working Jake control in USB at 1222. (Haverlah-TX)

6738.0 CANFORCE 4414 working Lajes GHFS with phone patch to Trenton military in USB at 2332. (Haverlah-TX)

6745.0 MIW-Israeli Mossad number station in USB at 2115. (Boender-Neth)

6750.0 Blue 01 working Reach 501 (tanker) in USB at 0150. (Haverlah-TX) *Definite Headancer mission enroute Kuwait/Saudi Arabia-Larry*

6758.0 MKL-RAF Scotland, with DE CW marker. Was on 6757, what gives? (Hardester-NC) *See Late Breaking News sidebar item-Larry.*

6761.0 Bone 91 (B-1B bomber Ellsworth AFB, ND) working another Bone aircraft with discussion of how to place a phone patch to a commercial number. Bone 91 suggested they try 11176. Move to 11176, made patch to Dakota Metro via Ascension GHFS then returned to 6761 for more chat-chit at 0407 in USB. This frequency seems to have become an interplane frequency for ACC bombers and tankers. Recent calls heard include Pond ## (KC-135 tankers), Earl ##, and Woody ##. (Bob Lewallyn-Houston, TX)

6830.0 Nightwatch 01 working Hickam with voice and data in USB at 1354. (Haverlah-TX)

6993.0 Darkstar 670 working Andrews in USB at 0145. Also SAM 972 working Andrews. (Whitney-VA)

7536.5 Alpha Charlie 4 working Upper 39 (aircraft?) at 1703 in USB for radio checks. (Baker-OH) *I have seen AC4 and 5 here before. It is either Army or Marine Corps; not sure which-Larry.*

7547.0 English female 3/2-digit number stations in AM at 1342. (Christopher Knight-Rancho Mirage, CA) *Welcome aboard, Christopher; hope you check in often-Larry.*

7609.0 Noted SELSCAN pulses here in this old Able Vigil frequency at 2106 in USB. (Haverlah-TX)

7696.9 CCS-Santiago, Chile, with 100 baud RTTY at unknown time. (Metcalfe-KY)

8016.0 Lovejoy working Hogleg 22 in USB at 1801. (Haverlah-TX)

8026.0 Andrews working PACCOM 01 in USB at 1405. (Haverlah-TX)

8095.0 Carnival 604 and Emery 806A working Sylvair Radio with LDOC traffic in USB at 0157. At one point, Emery 806A called Houston repeatedly; I am sure this was a mistake (*Yep-Larry*). Tim Braun (Grove BBS) is also hearing Sylvair on this frequency and 11470 kHz; neither of us is sure who this is. All aircraft heard are either airliners or freighters operating in Central America and the Caribbean. (Lewallyn-TX) *This is the first I have seen on this one. Anybody want to take a stab at it? Bob Evans, any comment?-Larry.*

8891.0 Baffin Radio working Japan Air 629 in USB at 2340. (Brookman-AK)

8967.0 Razor 20 (self IDed as EC-135 enroute Travis) working McClellan with a phone patch to Raymond 2 (at Tinker AFB) in USB. (Haverlah-TX)

8984.0 PACAF 01 and Spar 66 establishing guard with CAMSLANT Chesapeake after dropping Albrook GHFS support on 13247. The USCG operator didn't seem surprised by the request for service; this is the first time I have heard a USAF VIP aircraft use a USCG circuit for support. At 1741 in USB. (Lewallyn-TX)

8989.0 Air Force 1 working 29000 with technical chatter in USB at 1627. (Haverlah-TX)

9016.0 Reach 90026 with phone patch to Dover command post and Dover Metro via Andrews GHFS after moving from 6738 due to poor propagation in USB at 0013. (Lewallyn-TX)

9017.0 Uniform 32 working unidentified station in USB at 2147. (Haverlah-TX) Boeing-? Seattle at 2348 in USB working AGAR 02 advising that Agar 01 was airborne. (Baker-OH)

9023.0 Dragon or Dryden calling any station on AICC for radio check in USB at 1451. First time I have heard this frequency described as such. (Haverlah-TX)

9320.0 SAM 203 working Andrews on F-616 in USB at 0233. (Lewallyn-TX) Unidentified stations Shipyard and Bridge attempting contact with 47 Victor. 47 Victor position report placed it 32.7 miles from Shipyard. All in USB at 1540. (Metcalfe-KY)

10187.5 Possible US Navy Link 11 channel in USB at 1814. (Haverlah-TX)

10426.0 English female 5-digit number station in AM at 1815. (Hardester-NC)

11049.0 Scorpion Base called by Scorpion Alpha; said his prefix was 14 and going sat at that time in USB at 2216. (Fowler-MA) *Looks like a new JTF4 frequency-Larry.*

11176.0 Reach 405 (tail #59405) phone patch to Hilda via Offutt. Hilda indicated they heard 405's Satcom calls, but 405 apparently not receiving their reply; Tonight was also said to be calling the aircraft on Satcom. It was apparent from the conversation that these comms are voice, and that there is a primary and secondary Satcom frequency. In USB at 1518. B4L with phone patch to COMSUBRON Eight (Norfolk) via Offutt in USB at 2158. Advised 8 that B4L was excuting exercise 'Esteem Highly Alpha'. Bet that was another sub. (Lewallyn-TX) *I won't take that bet; I believe you are correct-Larry.*

11178.0 Falcon 01 working PJK in USB at 1837. Reported off station at 1830, estimating TNCC 2110. At 2057 reported in contact with Curacao and closing down on this frequency. (Lewallyn-TX)

11214.0 Sentry 61 (966 AWACS aircraft) calling Raymond 24, then Trenton military with no joy on either at 1916 in USB. Went to 1233 and returned to 11214 with Trenton and phone patch to Raymond 24. (Lewallyn-TX)

11214.9 Spanish female 5-digit number station in AM at 1905. Severely distorted modulation. (Lewallyn-TX)

11220.0 SAM 681 working Andrews in USB at 2225. (Lewallyn-TX) Sam 27000 working Andrews in USB at 2230. (Bird Southern-Trumansburg, NY)

11226.0 PACAF 01 working Hickam and Hickam also calling Offutt and McClellan in USB at 2320. (Haverlah-TX)

11229.0 Nightwatch 02 working Nightwatch 01. Aircraft 054 working Nightwatch 01, Normandy, Staghound and Seahawk al in USB at 2354. Also noted Gladiola working Nightwatch 01 and Mangrove in USB at 1924. (Haverlah-TX)

11440.0 King 63 working King 86 in the clear and in the green in USB at 2352. Then they said to move to HF2. Found them by accident later on 9023. (Haverlah-TX)

11460.0 Air Force Two with radio check on F-295 with Andrews in USB at 0139. (Lewallyn-TX)

11464.0 207 calling 201 then back to scan in USB at 1957. (Haverlah-TX)

12107.0 Iceman 13 (US Army unit from Ft Drum) in Haiti running health and welfare traffic phone patches in USB via Ascension at 0042. Came from 11634.0. (Lewalyn-TX)

13211.0 Nightwatch 01 working Tailgate in USB at 2015. (Haverlah-TX)

13247.0 SPAR 66 and PACAF 01 working Albrook with phone patch traffic in USB at 1612. (Lewallyn-TX) Intimate working McClellan GHFS after several QSY's for 'Pattern 3' conference call at 1808 in USB. After duel note tones, various commands check into phone patch including STRATCOM, Pacific command, Atlantic, Nightwatch, others. (Baker-OH)

13288.0 Honolulu ATC working Northwest 935 and Continental 3 in USB at 2315. (Levine-CA)

13354.0 TWA 1 working Honolulu ATC at 0025 in USB. (Brookman-AK)

13867.5 PTT Kinshasa, Zaire, with French SITOR-A traffic at 1116. (Robert Hall-Cape Town, RSA)

14615.0 Ascension working unidentified aircraft here at 2050 in USB. Moved here from 11176. (Metcalfe-KY)

15015.0 Reach 4P1 (tail # 60135) with phone patch to Hilda America call via Andrews in USB at 1700. (Lewallyn-TX) Fast 62 (C-130) with phone patch to Battlestar (Youngstown, OH) in USB at 1516. (Fowler-MA)

15048.0 Warrior 04 (US Army Ft. Drum unit) running phone patches stateside via MacDill in USB at 1812. (Lewallyn-TX)

15952.4 CXR-Chilean Naval Radio Montevideo, Chile, with Spanish 75 baud RTTY traffic for South American Naval circuit at 1550. (Hall-RSA)

16534.0 KWS578 working the yacht *Hornblower* off Cape Town, RSA in USB. (James Hugunin-Chicago, IL)

16955.0 UDH-Riga Radio, Estonia, working Russian ship using SITOR-A. (Hall-RSA)

17946.0 Philippine 801 working Honolulu ATC in USB at 2217. (Brookman-AK)

18214.8 CLP1-MFA Havana, Cuba, with 75 baud RTTY traffic to embassies at 1700. (Hall-RSA)

19724.5 UJY-Kaliningrad Radio, Russia, with 50 baud RTTY traffic to UPPX-*Batm Nivenskoe* at 1526. (Hall-RSA)

20401.5 Indonesian embassy Lagos, Nigeria, with SITOR-A traffic for "Deplu Jakarta" at 1451. (Hall-RSA)

Late Breaking News

Bart Brouwer of the European utility DX club, SC-MAC, has two frequency changes for military comms in Bosnia. The 'Deny Flight' voice-tell frequency of 3303.5 kHz has been changed to 8391.5 kHz. The 'Deny Flight' air warning frequency 4066.0 kHz has also been changed to 6207.0 kHz. Thanks to Gerbrand Diebels of the SC-MAC for forwarding the late breaking news via fax.

Those of you who frequent the aeronautical off-route (military) portion of the HF spectrum may have noticed that the frequencies for some of your favorite channels have changed. (i.e.-USCG 8984 to 8983, CANFORCE 11233 to 11232, etc). At this point we can only speculate regarding what initiated this change. We hope to have more information on this shift in next month's column.

Bob Kay, c/o MT, P.O. Box 98, Brasstown, N.C. 28902

Scanning Questions

Scanning in January has always been an exciting experience. During the first few weeks of the new year, the majority of hobbyists who found new equipment under the Christmas tree will be trying it out.

The three most popular gifts are scanner radios, antennas, and frequency counters. Each year, during the month of January, my mail bag is full of questions from hobbyists who are experimenting with new gear. Here are a few of the most frequently asked questions.

Q. *Will a desktop scanner radio pull in more signals than a handheld model?*

A No. The internal components in a handheld radio or nearly identical (although smaller) to the components in a desktop model. The ability to capture weak signals is not related to physical size.

Q. *How can I convert my scanner radio to receive the 800 Megahertz band?*

A: Internal modifications are possible on a few 800 MHz models. In past issues, *MT* has provided the necessary information. However, new monitoring laws prohibit manufacturers from producing scanner radios that can easily be converted. The alternate solution is to purchase an aftermarket 800 MHz converter. These devices are advertised in the pages of *MT* and can be sold until the stock is gone.

Do you have questions about your new equipment? The Scanning Report will take them on!

Q. *When I enter a seven digit frequency into my scanner, it rounds the frequency to six digits. Is my reception compromised?*

A. No. Selectivity in scanner radios is typically 15 kilohertz wide. If you punch in 165.2375, for example, the LCD window will display 165.235. Dropping the 4th digit after the decimal represents a minor mistuning that your ears can't detect.

Q. *If I add a splitter and second scanner radio to my antenna feed line, how much loss will occur?*

A. A loss of approximately 3dB. If you live in a strong signal area, a 3dB loss probably won't be noticed.

Q. *When I connect my power cord to my scanner and by-pass the batteries, I pick up more signals. Why?*

A. It's got nothing to do with "more power." The added metal of the cord is acting like a ground radial and is increasing the efficiency of your vertical whip antenna.

Q. *Will the batteries in my hand held scanner discharge more rapidly if the volume is set at a high level?*

A. Yes. You'll use between 50 and 100 milliamperes.

Q. *How can I ground the plastic cabinet of my scanner radio?*

A. Attach a ground wire to a metal part that is connected to the internal circuitry. The external antenna or earphone jack are two likely candidates. Remember, a ground will not make signals stronger. Grounding will reduce your shock hazard and electrical line noise.

Q. *Do I need an outside antenna?*

A. It depends on your location, and your monitoring interests. Scanner buffs who live in large cities are usually satisfied with a small, indoor antenna. Hobbyists living in the suburbs erect outdoor antennas to increase their monitoring range.

Q. *Do attic mounted antennas perform as well as rooftop antennas?*

A. A rooftop antenna will provide the best overall results. Attic mounted antennas may not perform as well, but they do offer several advantages: Low maintenance, easy access, and they are rarely struck by lightning. If you don't like climbing on the roof, an attic mounted antenna may be the ideal solution.

Q. *Why do some antenna manufacturers recommend PVC masts rather than a metal mast?*

A. Any metal mass that is parallel to the antenna will affect incoming radio waves. The effect is especially troublesome when using beam antennas. Ground plane and discone antennas that are mounted above the mast are not affected.

Q. *How can I verify that my frequency counter is working?*

A. Place the counter within a few feet of a walkie-talkie or similar transmitter and press the transmit key. The counter should display the active frequency. Don't have a transmitter? No problem. Take the counter to a radio shack store and ask the clerk to "key" a display unit.

Q. *What is the "triggering" range for a frequency counter?*

A. Approximately 100 to 150 feet for a base transmitter and between 10 and 50 feet from mobile transmitters. Don't forget that a frequency counter can be adversely affected by neon signs, vehicle ignitions, weather conditions and dozens of additional items that are common to metropolitan areas.

Additional questions and comments are always welcomed. Send your letters to the Scanning Report, P.O. Box 98, Brasstown, NC 28902. A self addressed stamped envelope guarantees a personal reply.

Treasure Hunt

To begin the new year, Gene Hughes is giving away two complete sets of *Police Call*. As you already know, Gene is the publisher of *Police Call* and he is currently printing the 1995 edition.

Each volume of *Police Call* contains thousands of frequencies for specific locations. The complete nine volume set places the frequencies for all 50 states at your fingertips. Here are the clues:

1. Provide the high and low frequency range for the VHF low band.
2. What is the bandwidth of the VHF high band?
3. What is the "IF" frequency for your scanner radio?
4. In the 453 MHz UHF Police band, repeaters are offset 5 MHz from mobile units. True or False?
5. In what year did Ronald Reagan prohibit the release of federal frequencies?

Our two lucky winners will receive the completely revised, 1995 edition of *Police Call*. All nine volumes, over 300,000 frequencies, will be sent directly from the publisher to the winner's doorstep. Good Luck.

Frequency Exchange

Since it's cold and miserable in the Northeast, let's travel south to **Douglasville, Georgia.** An anonymous contributor has sent in the following business frequencies.

158.28 ..... IBM corporation
154.70 ..... Kmart
150.95 ..... Motorola-Boynton Bch.
154.625 ..... Motorola-Boynton Bch.
462.375 ..... Motorola-Boynton Bch.
461.20 ..... Palms Hotel
464.425 ..... Rayside Trucks
464.975 ..... Sheraton Hotel
461.90 ..... Wet World

Traveling further south, our next stop is the home of Bernice Hull. Bernice lives in **Dade County, Florida**, and she enjoys listening to the Highway Patrol.

39.16	44.90	154.695	159.15
39.94	45.10	154.71	155.505
45.06	45.46	154.92	155.445
44.86	45.82	155.37	

Dan Rollman, lives in **Orlando, Florida**, and he wants to invite everyone to monitor "Universal Studios."

451.75	462.0125	463.6125	463.9375
461.2875	462.925	463.6375	464.1375
461.8875	463.3875	463.6625	464.2125
	463.5875	463.7125	

You'll need a coat for our next stop. Sue Wilden lives in **Columbus, Indiana**, and here are her favorite frequencies:

154.845 ..... Columbus Police
154.40 ..... Columbus Police
155.535 ..... Bartholomew Sheriff
155.91 ..... Bartholomew Sheriff
46.42 ..... Indiana State Police
453.70 ..... South Bend Police
453.625 ..... South Bend Police
453.70 ..... South Bend Police
453.625 ..... South Bend Police
453.65 ..... South Bend Police
453.575 ..... South Bend Police
159.15 ..... St. Joseph County Police

Don't give away your scarf and mittens. It's cold and windy in Mark Loether's home town of **Tomah, Wisconsin**.

48.36 ..... Power & light
48.52 ..... Gas Company
154.905 ..... State Police
155.205 ..... Monroe County Sheriff
151.46 ..... State Police
159.45 ..... State Police
170.175 ..... VA Medical Center
155.43 ..... Sheriff
453.575 ..... Highway Department
165.085 ..... Fort McCoy Provost Marshal
165.185 ..... Fort McCoy fire dept.

Four our next stop, we'll monitor the military aero frequencies in **Northfield, Minnesota**. Norm Pihale has provided the frequencies and free refreshments.

Minneapolis-St. Paul	*Duluth*	*Joe Foss Field*
139.900	288.900	138.025
314.200	399.000	253.400
240.150	139.900	390.100
252.100		346.250
351.200		

Sioux City Gateway	*Peoria, Illinois*	*Fargo, North Dakota*
373.100	138.050	238.200
394.200		262.000
346.250		298.700

If you're chilled to the bone and can't wait for spring, don't miss our last stop—welcome to **Miami, Florida**. An anonymous reader sent in a complete profile of the new 800 system in Miami. The document contains eight pages of information and frequencies. Here's a sample:

TX	RX	
823.5125	868.5125	Lake District Dispatch
821.0375	866.0375	Northside District Dispatch
823.8875	868.8875	Doral District Dispatch
867.0625	867.0625	Car to Car
809.0625	854.0625	Intracoastal Dispatch
821.0625	866.0625	Support 1
809.2875	854.2875	Support 2
822.5375	867.5375	Special Events #1
823.2625	868.2625	Special events #2

Repeaters

866.7375	Repeater #1 (RPT-1)
867.2325	Repeater #2 (RPT-2)
867.7375	Repeater #3 (RPT-3)
868.2375	Repeater #4 (RPT-4)
868.7375	Repeater #5 (RPT-5)

The complete listing contains a variety of frequencies and unique information. Radio ID numbers, for example, are listed with the actual "display" codes that appear on the "LCD" window of mobile transmitters. Group numbers are also identified as well as the frequencies for channel guard tones.

The complete list is available for exchange. Send eight pages of your favorite frequencies and/or information to the Frequency Exchange and I'll send the eight page Florida list to your doorstep—absolutely free. Here's the address: Frequency Exchange, P.O. Box 98, Brasstown, NC 28902. If you don't have eight pages to exchange, send three dollars ($3.00) to Bob Kay, P.O. Box 173, Prospect Park, PA 19076 and I'll send you a complete copy of the list.

To invite the Frequency Exchange to your neck of the woods, send your favorite frequencies to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902. All lists are welcomed.

Scanning and Cruising

"Cruising" in Los Angeles, California, is a popular pastime. The "hot spot" for teenagers and their vehicles is from Adams Blvd., south to 78 Street.

The LA Police Department is attempting to limit Sunday cruising by setting barricades on specific streets. To hear the cruising action, you'll need to monitor the LAPD on the following frequencies: 506.9875, 507.2375, 507.0375, 507.0875, 506.8375 MHz.

Mayor Tunes In

Jerry Jennings is the Mayor of Albany, New York. And according to the Albany Police, he's also a scanner buff. If there's a fight brewing or a hostage incident, the Mayor is there. He monitors the action on his personal scanner radio. "It's for my own information, so I can hear what's going on in the city," the Mayor said recently.

Albany police officers don't have any complaints about the Mayor's involvement. But they are concerned that the Mayor may wander into a dangerous crime scene. (News clipping from Bob Elder, Glenmont, NY)

Next Generation NOAA Weather

NOAA weather in Florida is broadcasting more than just weather forecasts. Florida and the National Oceanic and Atmospheric Administration officials signed an agreement that will turn weather radio into "All-Hazards Radio."

When a hurricane threatens, NOAA radio will broadcast shelter and road information. After the emergency has passed, NOAA weather will tell people where help is available.

NOAA radio in Florida will also broadcast hazardous material spills on local highways. The weather service has 16 NOAA weather stations in Florida, operating around-the-clock. To reach more listeners, the weather service is planning to install six new broadcast stations.

The weather service operates on the following frequencies: 162.55, 162.40, 162.475. 162.425, 162.45, 162.50, 162.525 MHz.

New Air Frequencies

Did you know that the aero band has been expanded? The new frequencies are:

136.000	136.125	136.250	136.400
136.025	136.150	136.300	136.425
136.050	136.175	136.325	136.450
136.075	136.225	136.350	

Readers are reporting that there isn't too much activity on the new frequencies. Check them out in your area and let *MT* know what you hear.

Scanning the Kids

January is a great time to monitor the airwaves for kids and their two-way radio toys. One of the most popular frequencies is CB Radio channel 14 on 27.125 MHz. Other low power frequencies that are often used in toys are: 27.49, 35.04, 42.98, 151.625, 154.57, 154.60 and 158.40 MHz.

The baby monitor frequencies are also used in low power, two-way radios. Check out 49.83, 49.845, 49.86, 49.875, 49.89 MHz.

Finally, check out the low power, wireless microphone frequencies. Since power is limited to 1/20 watt, you'll need to be within close proximity to the transmitter: 169.445, 169.505, 170.245, 170.305, 171.045, 171.105, 171.845, 171.905 MHz.

Phone Scanning

Cordless phones are popular gift items. While house-bound during the month of January, you can discover the new cordless phones in your neighborhood. Here are the frequencies: 46.61, 46.63, 46.67, 46.71, 46.73, 46.77, 46.83, 46.87, 46.93, 46.97 MHz.

The new 900 MHz cordless phones operate between 902 MHz and 928 MHz. Some of the models are digital, and cannot be monitored. Since the phones can operate on multiple channels, the best monitoring method is to search between the high and low frequencies.

Auto Club Scanning

January is also an excellent time to monitor your local auto club. On extremely cold mornings, the auto service frequencies are red hot with service calls from motorists with cars that won't start. Here are a few of the nationwide frequencies: 150.905, 150.92, 150.935, 150.95, 150.965, 452.525, 452.55, 452.575, 452.60 MHz

Taxi Cab Scanning

Aw, what the heck; forget the car and call a cab. Listening to taxi cabs may not be too exciting, but it can be entertaining. And as you probably already guessed, the best time to listen is during inclement weather. Here is a partial sampling of base/mobile, taxi cab frequencies:

152.270/157.53	152.33/157.59
152.285/157.545	452.05/457.05
152.30/157.56	452.10/457.10
152.315/157.575	452.15/457.15
	452.20/457.20.

Tune in next month for more scanning hints, ideas and frequencies.

AR 8000

The New Concept - AR8000 shocks the market. AOR made every effort to incorporate the latest technology in to this new scanner.

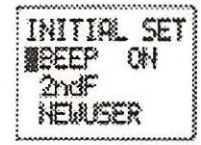
• SPECIFICATIONS •

- **Range:** .5 - 1900MHz usable to 100kHz
- **Modes:** AM/NFM/WFM/USB/LSB/CW
- **Stepsize:** 50Mz to 999.995kHz
- **Sensitivity(μV):** 30 to 1000MHz
  SSB .2 **AM** 1.0 **NFM** .35 **WFM** 1.0
- **Filters:** (kHz) **SSB** 4 **AM/NFM** 12 **WFM** 180
- **Memories:** 50 ch. x 20 banks=1000 total
- **Size/Wt.:** 6.1 x 2.8 x 1.6 inch. 20 oz. batt. incl.

* Cell blocked for all, but Approved agencies.

- **Covers .5-1900MHz***
- **Ferrite Rod antenna below 2MHz**
- **Only portable scanner on U.S. market to have true SSB, both LSB & USB. Others attempt SSB using a BFO, but are difficult to tune and produce poor SSB audio.**
- **4 level alpha numeric LCD read out frequency, mode, signal strength, band scope spectral display, battery low, remote and more**
- **Computer control up/down load data, will add a new dimension to the world of scanning.**
- **Clone your memory banks with a friend, load 1000 memory channels in seconds**

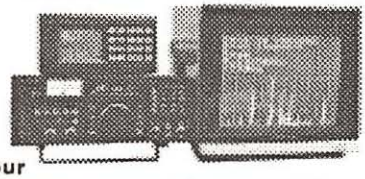
.1 - 1900MHz*



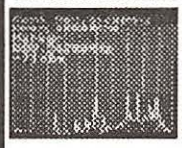
The Latest From AOR Products

SDU 5000

eta 12/95

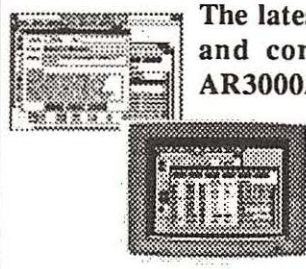


The Spectral Display Unit adds a new dimension to the signal interception hobby. Imagine seeing stations above and below your receiving frequency. Usually the transmissions are short, perhaps 1 or 2 seconds. What are the chances of you being tuned to the exact frequency at the instant of transmission? Very slim. With an SDU you can watch for stations to pop up over a 10MHz window, then zero in. The SDU 5000 offers features unheard of only a year ago.



Δ Frequency coverage up to 10MHz Δ Display - 3.1" HQM Simple matrix color LCD Δ Resolution: 5 or 30kHz selectable Δ Input: 10.7MHz Δ 50dB Dynamic range Δ Screen refresh 2/s Δ Composite video out Δ Full computer control Δ Video output NTSC or Pal display, on TV or record on VCRΔ RS232 9600bps Δ Instant receiver set from cursor via RS232 Δ Store image on disc or your video recorder Δ Menu driven system makes SDU5000 simple to operate Δ SDU5000 is designed to work with the AR3000A (modified with a 10.7MHz output) using RS232 link with or without a computer. Other receivers with 10.7MHz IF output but digital linking may not be straight forward.

AOR SEARCHLIGHT



The latest AOR software for IBM and compatible control of the AR3000A, using the computer's RS232 serial port. DEMO disk available at your dealer for $10.00 (Save towards the purchase of the full program.)

FEATURES: **•Microsoft Windows Program** -foreground and background **•On-line help** -*Windows* hypertext provides info you need, also dialogues have "help" function **•Fully supported *Windows* Sound Recording** -Correctly configured compatible sound card allows recording from your receiver while scanning or analyzing frequencies. A log contains all the recordings for replay. **•Unlimited number of disk based memory banks** -Each memory banks contains 400 memory channels and can be uploaded or downloaded to and from the receiver. Up to 10 banks may be viewed on-screen at once and an unlimited number may be stored to disk (restricted by your space). **•Copy date to & from clipboard** - Bulk editing and export data base (not supplied) or other *Windows* applications. **•Memory scan and Programmable Band Scan** -Provides a histogram display showing the activity of each channel. Full control is provided including a cursor indicator (optional).

EDCO

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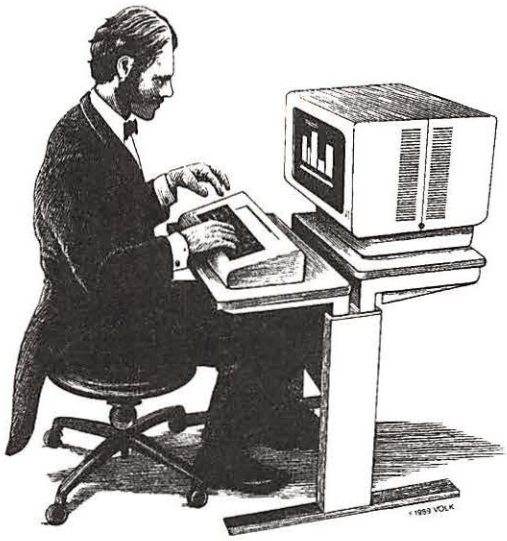
High Tech Learning Tools



"Hmmm . . . Maybe I can finally throw away my quill!"

I may have mentioned this half a hundred times or so (check the back issues) but I really have a hard time figuring out how I got along before the advent of the personal computer. I don't think my illustrious editor would be as happy with my column copy if I sent it out via snail mail after pounding it out on my old Smith & Corona manual mill. (Especially the way I push a deadline.)

Thanks to the PC, I now zip it on down the phone line via a 14.4 bps modem—that is, after I transform my word processed rantings into near perfect copy by running them through both spelling and grammar checkers. Clearly, whatever skill I may have as a radio hobby writer and teacher are enhanced by using the computer to help get my point across.

The computer is not the only technology that has had a big impact on our lives over the last ten or fifteen years. Hey, I remember the days before VCRs! Heck, I even remember back to those days in the early sixties when my Uncle Jimmy used to shoot home movies with his Bell & Howell 8 millimeter camera. You know—the one with the big "light bar" that used to make you squint? (I wonder what he ever did with all that footage of squinting children?)

But I digress. The VCR not only brings movies home where you can make the popcorn just the way you like it; the VCR allows you to take instruction in the privacy of your own home as well.

What this is all leading up to is a chance to show you how you can use home computers and VCRs to help you grow in the radio hobby. Specifically, we're going to take a look at how you can use these two tools to help you extract a license or two from the Federal Communications Commission.

Not too long ago, folks who wanted to take either a commercial or amateur FCC radio license test had to hit the books, or take a few courses—Not to mention hours of practicing for the Morse code portions of the tests. After all this study and sweat, you then had to traipse to the nearest (and often not so near) FCC field office for the purpose of wading through the bureaucracy and sitting for the test. And just try to tell your Dad that you failed your exam after he took the day off from work to drive you into the big city!

Yeah, I know this sounds a bit like one of those "walking four miles uphill in a snow storm to school" stories but it really was a pain to get your license in the unenlightened days before deregulation.

The modern world that brought us computers and VCRs also brought us a kinder and gentler FCC that decided that license testing could be turned over to Volunteer Examiners. Today you can often sit for your choice of FCC amateur and commercial exams in your own hometown. It's just a matter of calling that FCC field office you used to have to travel to and find out the name of your nearest VE.

But there still is this little matter of studying for the exams. Modern technology has changed that for the better as well. Learning what you need to know to face the toughest FCC test can all be accomplished at home, in your spare time, with the aid of the home computer and the VCR.

Conquering the Code with Computers

The International Morse Code requirements that go along with most of the FCC amateur radio exams have always been a burden to folks who do not enjoy the code. Much of the bad press associated with learning the code could be chalked up to the old ways of studying it.

In the past, you had to copy Morse code off the air or off records and tapes. The stuff off the air was not always good because not every code operator you heard had a "clean fist." Your only hope for success with off the air copy was to monitor scheduled code practice sessions. My problem was finding a practice session at the speed I needed at a time I was free to study. Copying poorly sent code could hinder more than help someone getting ready to face the machine sent code at exam time.

Tapes and records were repetitious enough that you began to memorize the patterns. I have one 13 word per minute audio tape that I haven't touched since I sat for my General Class license quite a few years back. I think I still remember half of the stuff on that tape. Records and tapes also created problems with building speed. Common speeds used were 5, 7, 10, 13, 15, 18 and 20 words per minute. If your brain was wired so that you hit a wall at 12 wpm you were stuck with tough practice until you broke through to the next speed.

The home computer has changed all of this. Various programs are available commercially and as shareware that allow you to master the Morse code with a minimum of heartache. The computer programs allow you to increase your code speed incrementally, sometimes bringing it up by a little as a tenth of a word per minute. This is a sure fire way to wiggle through any barriers your mind might try to set in your

way. Code programs also have the ability to send random code groups and even FCC test-like "plain text" with sufficient randomness that you will never memorize the messages. Computer code also allows the student to take full advantage of the "Farnsworth" method of code training. This is where you learn the individual characters at a high speed but hear the groups and letters spaced out at a more manageable speed. For example you would copy 20 wpm characters spaced out at 5 wpm. This is the fastest way to Extra Class code speeds.

Shop around with the advertisers in *MT* and check out your local computer BBS operations. Code programs are everywhere. One piece of software that I know of that provides all of these features is the "GGTE MORSE TUTOR" available from The American Radio Relay League (ARRL), 225 Main St., Newington, CT 06111 The cost varies between $20 and $30 depending on disk size and version. Call (203) 666-1541 for more details.

There's More to the Test Than the Code

Right you are, Bunky. Even if you become a wiz at the code, you still have to power through the theory and law written exams. You can still purchase books and study guides to get you where you want to go. But,if you have a PC and a VCR, you can go there in style.

Video Study

I can remember my mom yelling at me for doing my homework while watching television. Now, watching TV can be your homework, especially if you're planning on studying for an FCC exam. The same ARRL mentioned above has produced video courses for both the Technician and General Class amateur licenses.

These comprehensive courses each consist of video tapes, study guides and practice tests that take you through all of the theory and law you need to get your ticket. One picture may be worth a thousand words, but three video tapes are easily worth the many hours you can spend trying to master these materials on your own.

After examining both of these collections of video based study materials, I can only imagine how much more positive my learning experience would have been when I "went downtown" to take those tests so many years ago. I even turned Number One Son and a couple of his friends on to the "Tech" tapes. I may just have found the way to hook my kid on the hobby after years of trying. Again, you can call the League for more details. It's okay to tell them Uncle Skip sent you; I'm a Life Member so my dues sort of helped make this all possible.

Practical Practice Tests

Current FCC commercial and amateur written exams are given in a standard "multiple-choice" format. Further, all the questions that appear on these exams come from standardized "question pools." These question pools are available in book format and come with most of the commercially produced learning packages. However, mix in one standard home computer, and taking practice exams couldn't be easier. Just load up software containing the question pools appropriate to your particular test and give yourself a whole mess of practice tests. This will help you figure out which areas of knowledge require further study and practice.

Again, question pool programs that set you up to take practice tests are available both commercially and as shareware. The ARRL packages mentioned above can also be purchased with optional exam generating software. The only thing you have to keep an eye on is checking to see that the software you are using includes the most recent FCC question pools. Commercial stuff is usually up-to-date but some shareware programs could be years out of date. A call to your nearest FCC field office will reveal the expiration date on the various question pools you may be interested in.

Uncle Skip Gets His GROL

The FCC deregulation and volunteer examiner program for commercial licenses gave Old Uncle Skip the chance to put computer based learning to the test. Last summer I decided to sit for the General Radio Operator's License (GROL). This test consists of two elements: one on radio law and one on electronic fundamentals and techniques. Its question pool is very similar to that of the amateur radio extra class license.

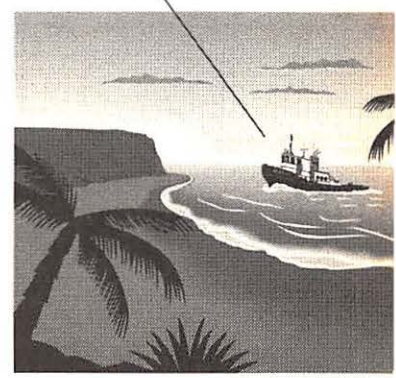
I shopped around and acquired a computerized "question pool" program for this license. I settled on the package put out by National Radio Examiners, PO Box 565206, Dallas, TX 75356. Once I gave myself a few practice tests, I had a good idea of my weaknesses and was then able to hit a few text books to fill in the gaps in my learning. The whole process took about a month of studying an hour or so a few evenings each week. I've been at this for a while so your learning curve may vary.

Once I found myself passing every randomly generated test the computer could throw my way, I called the FCC and got a list of local volunteer examiners. My VE, Joe Szumoski, is an electronics educator affiliated with the International Society of Electronics Technicians. Soon after application and fees were moved through the ISCET offices in Texas, Joe invited me into his home where I took both examination elements with confidence brought about by computer aided learning.

I am happy to say that I can now add GROL to the list of letters behind my name. And when days at work get difficult, I can dream of shipping out as the radio operator on a trap steamer bound for far off South Sea isles.

There are many software programs to aid the hobbyist in earning an FCC license—you'll find some, like QSO Tutor, in the pages of MT, others are from W5YI, Gordon West, the ARRL, and many other commercial and non-commercial sources.

"Yo ho ho and a bottle of soda"



Glenn Hauser, P.O. Box 1684-MT, Enid, OK 73702
fax: (405) 233-2948 ATT: Hauser

In the Shadow of the Ax ...

ISRAEL's shortwave service is threatened with closure again Jan. 1 for lack of funding, according to Israel Radio's *Calling All Listeners*. Write those letters to Ms. Shulamit Aloni, Minister of Communications, 23 Jaffa Road, Jerusalem 91999; or fax +972-2-240-029 (Daniel Rosenzweig, USENET via Thurman)

KOL ISRAEL English Service
P.O.B. 1082 · Jerusalem 91010 Israel

The ax has already fallen on **VOA Bethany** and 100 VOA employees who have lost their jobs. The last day on air from VOA Bethany was Nov. 14, at which point engineer John Vodenik went back to Washington still lobbying to get it reactivated, according to Diane Mauer of Wisconsin. Besides closing Bethany, three 500 kW transmitters at Greenville were switched off for a total of nine VOA SW transmitters closed in the US (RN*MN*).

Joe Bruns of the USIA said in the VOA publication, *Communications World,* that $400 million must be cut in next four years from US external radio and TV; he said they did their best to minimize the impact on those let go, but more cuts are likely. At this time, 38 broadcasters and 13 Bethany employees lost their jobs. Tanya Bricking of the *Cincinnati Enquirer* reported the Bethany station will operate as a job-training center until mid-January. Then, transmitters will be moved to other relay stations (via Mike Schulsinger)

According to Radio **CANADA** International's new *Mailbag* host, André Courey, RCI faces more budget cuts in 1995—its 50th anniversary year—to be made known at end of December. RCI may have to resort to more CBC programs. CBC, including RCI, must cut 1000 of 9000 jobs in next four years, said Radio Netherlands' *Media Network*. André Courey replaced Bob Girolami as *Mailbag* host, and seems to be in better touch with developments at RCI; *Mailbag* is heard Sun 2130, 2330, UT Mon 0330.

Stay of Execution ...

Radio Prague, **CZECH REPUBLIC**'s external service, has had its contract renewed, but for only one year; the final decision is to be taken at end of 1995. Meanwhile, Radio Prague is now on E-mail: cr@radio.anet.cz (BBC Monitoring and Peter Costello, USENET via Thurman)

ALGERIA R. Algiers Int'l, English moved from 1500 to 1800-1900, weak but clear only on 11715 tho announcing many others—17745, 15215, 15205, 15160, 9640, 9535, 7145 (Brian Alexander, PA, *World of Radio*)

BANGLADESH R. Bangladesh, Box 2204, Dhaka, English at 1230-1300 on 9650, 13615 has *From Us to You* mailbag Fridays (Craig Jordan, CA) 13614 confirmed with letterbox, excellent signal and crystal-clear audio—unbelievable! (Tsunaaki Ashimori, SPEEDX) But you're in *Japan*! (gh)

BELARUS R. Minsk has irregular English segments around 0045 on 7150, via DVR 13640, 17665—interviewed US scientists (Walt Salmaniw, B.C., *WOR*)

BOLIVIA R. Mauro Núñez is new FM/SW station in Villa Serrano named for *charango* master, inaugurated Oct. 1, but frequency not yet found (Gabriel Iván Barrera, Argentina, World DX Club *Contact*) See PERÚ

BRAZIL DW relay in Spanish at 2300-0050 is supposed to use 2 x 250 kW in parallel on 11810, but one of them is actually on 11813.1, strongly heterodyning the other (AGDX Monitoring & Information Service—AMID via Wolfgang Büschel) 3+ kHz error as previously evidenced by Brasília for Swiss relay 5885/5888, RNB 15265/15268, 15445/15448; 11813 also bothers Spain/Costa Rica 11815 (gh)

CFCX, 6005 went back to French relay, but gave SW ID at 2000 and 2100 in English, French and Spanish (Jerry Berg, MA, *Fine Tuning*)

CHINA (non) CRI moved relays down from 11 MHz for winter: 0400 on 9730 via Guiana French, 0500 on 9595 via Canada, the latter often not propagating either, but 9730 is best (gh, *WOR*)

CRI 国内统一刊号 CN11—0124

COSTA RICA RFPI's *Far Right Radio Review* continues weekly but live call-in to 1-800-404-RFPI made every three weeks, such as Dec 31 if previous pattern holds, UT Sats 0230; repeats at 1030, Sun 2230, Mon 0630, Fri 1830. Erwin Knoll, editor of *The Progressive*, died Nov 2; his *Second Opinion* was on RFPI Tue 1800, Fri 2130 plus repeats (gh, *WOR*)

AWR Latin America resumed Costa Rican *Week in Review*, Sun 1230 on 9725 (Chuck Bolland, FL, *WOR*) Later shifted to 1200-1214, from *Tico Times* (Bill Westenhaver, PQ) New 7374.97 from 0200 past 0830 including English 0645-0830 (Brian Alexander, PA) RFPI's former frequency, audio less distorted than 9725 (Tim Hendel, FL) Also check 5030, 6150, 13750, not always all active; *Week in Review* may be repeated Sunday evening (gh)

CUBA (non) Perhaps due to jamming, formerly stable Voz del CID shifted from 9941.4 to 9924.5, 9920.8 (Ulis Fleming, MD, *Fine Tuning*)

DOMINICAN REPUBLIC R. Quisqueya reactivated one day only on 6235.2 at 2255-2312 pops; full ID invited reports with return postage to Apartado Postal 135-2, Santo Domingo (Ed Rausch, NJ)

*All times UTC; all frequencies kHz. *Asterisk before/after time station sign-on/sign-off; // parallel; + means continuing but not monitored; = 2 x indicates 2nd harmonic of following frequency.*

ECUADOR Five transmitters of La Voz del Upano configured this way at 1100; 5040 with wake-up show; educational program on 3360//5999.4, two more different educational shows on 5965, 4870. R. Central, Riobamba, no longer heard on 4680 = 4 x 1170, but on 3510 = 3x at 1000 (Henrik Klemetz, Colombia, HCJB *DX Partyline*) R. La Mejor, Huaquillas on 2260 = 2 x 1130 at 0957-1034, old guitar music, ads and messages, not listed in *WRTH 94* (Fernando Viloria, Venezuela via Santiago San Gil)

FINLAND YLE had no English on a Sunday until 1430 on 15400, 17740, but the Finnish at 1400 was slow-speed, still incomprehensible (gh)

FRANCE Second strike at RFI lasted two weeks, then back to normal (gh) Complete English sked till March 5—relay sites no longer given but some here assumed: N. America 1200-1300 on 13625-Guiana French, 11615, 15365; elsewhere 9805, 15155, 15195; 1400-1500 17560, 12030, 7110-China; 1600-1700 11615, 11700, 12015-Gabon, 15530, 9485, 11995, 6175 (via Gigi Lytle, Bob Thomas) Has enjoyable mailbag show *Club 9516* Sundays at 1235; announced additional English to East Africa at 1700-1730 (George Thurman, IL) Seemingly only on 9485, 11700 (gh)

GEORGIA R. Georgia, Tbilisi, announces six English broadcasts, but heard only at 0700-0730 on 11805, 1100-1130 on 11815 (BBCM via RN*MN*) English starts at 0730 (RVI *Radio World*)

GERMANY PTT, not DW, owns SW transmitter sites in Germany; long-term contract calls for expanding Nauen site west of Berlin with new 500 kWs and revolving antennas; plans 500 kW only here and at Wertachtal; may close ancient Jülich and Königs Wusterhausen sites. DW itself owns relay sites in Portugal, Rwanda, Malta, Sri Lanka, and with BBC, Antigua (DW via Wolfgang Büschel)

GREECE VOG at 0000-0350 replaced 15650 with 7450 //9420, 9935; VOG also left 9395 at various times so Makedonias station could use it: 0600-2300, //11595 until 2100, //7430 from 1700 (John Babbis, MD, *WOR*)

GUAM KTWR in English: 0800-0915 Far East 15200, 1500-1630 (Mon/Tue 1615) 11580 S Asia, 0855-1000 11830 S Pac (Mike Murray, WDXC *Contact*)

HAWAII *World of Radio* on KWHR changed to: Sat 1729 on 6120, 2200 on 17510, Mon 0330 on 17510 (Joe Hill, WHR) 6120 is excellent to Oceania, but too early in morning (Cushen, NZ)

HONDURAS R. Luz y Vida, 3250, reactivated after long time in mid-Nov., 0130-0330 (Don Moore, IA, HCJB *TLC*)

INDIA Another four 500 kW SW commissioned at Bangalore, in addition to two already, with 36 multiband curtains (AIR TV via BBCM) Only site capable of 13 MHz band, 13750 and 13700. Two 250 kW at Panaji, Goa, delayed for lack of staff, same problem for regional Sikkim and Itanagar sites. 50 kW planned at Jeypore. Vividh Bharati service synchronized 100 kW at different sites all on 10330: 0100-0430, 0700-1200 (Sun 0630-) Madras; 0130-0430 Bombay; 0100-0430, 0700-1000 (Sun 0630-), 1330-1730 Kingsway (Manosij Guha, *DX Ontario*)

INDONESIA R. Pantai Utara (North Coast Broadcasting), 7080 at *1400-1420*, *1440-1500* Tu/Th/Sa, *2200-2250* Sun; report to J1. Jelambar Utama Raya 61, Jakarta 11460 (Akhbar Indra Gunawan, Indonesian DX Club via *OZDX* via DSWCI and NASWA) Pirate?

INTERNATIONAL VACUUM *World of Radio* is on World Radio Network: to Europe via Astra 1B, ch 22-V, 7.38 MHz, Sat 0500, 1700; to America via Galaxy 5, 6-V, 6.80 Sat 2000; one hour earlier during DST. It is hoped the one-week delay will be overcome in 1995 (gh)

IRELAND R. Dublin moved from 6910 to 3937 (Mike Barraclough, WDXC *Contact*)

ITALY R. Mariquita uses 10 watts on 4032, 4096 or 4115; heard at 2310-0005 on 4031.07, non-stop ABBA music, no announcements, no ID (Martin DD9MW, Germany, via Büschel)

JAPAN More staff turnover: Mark Robinson turned Radio Japan's *Media Roundup* over to Ayumi Hoshino (via Diane Mauer, John Norfolk) Real star remains the never-credited producer/writer; best times for us are now Sun 0525 on 6025, 1425 on 11705, 9535, 2125 on 11925 (gh)

KALININGRAD Detached from Russia and considered a separate radio country, GPR-2, St. Petersburg, also operates transmitters here, some currently scheduled: 0430 on 5905 Aum Shinrikyo, 0500-0600 VOR English; 2100-2300 on 5920 VOR English; 0200-0400 on 7225 R. Slavyanka Tu-Su, VOR English Mon; 1700-1900 on 7325 R. Slavyanka Mon-Sat, VOR English Sun; 1000-1100 on 9680 VOR German, 1100-1500 English; 0300-1400 on 11965 R. Nadezhda (via Ed Rausch, NJ)

KURDISTAN V. of Iraqi Kurdistan, based in Salah al-Din, at 0345, 1030, 1545-1630 on 4180; V. of the People of Kurdistan, 4282, *1630-1800* (Finn Krone, Greece, DSWCI)

MALI CRI relay, 11715 putting out nasty distorted spurs every 60 kHz from 11475 to 11895, one QRMing R. Netherlands on 11655, at 0100 (Randy Stewart, MO, *WOR*)

MOLDOVA R. Moldova Int'l confirmed on 7190, *0130-0225* in Romanian, from 0200 English, one day blocked at 0200, next day weak but clear, following day missing (Brian Alexander, PA, *WOR*) Correction to Dec *MT* p. 47: 1430 on 15315, not 5315 (gh)

MONGOLIA R. Ulan Bator on different, complicated sked since Sept, some times not checking out, but basically monitored in English including new service to North America: Wed/Thu 0300-0330 on 7295, 12015; Mon, Fri, weekends 0330-0400 on 7295, 12000; 0910-0940 Daily 7295, 12000; Thu/Sat same at 1200-1230; Mon/Wed 1200-1230 on 7295, 12015; 1445-1515 daily 7295, 12000; 1940-2010 7295, 13650 (Y. Kato and S. Aoki, RJ*MR* via John Norfolk)

MYANMAR (non) Democratic Voice of Burma, via Norway, added another daily program at 0030-0100 on 9660; 1430-1500 on 15180 ex-11850 (Finn Krone, Denmark, AWR-DX and DSWCI) *Note: the explanation of "(non)" in Dec* MT *p. 47 is wrong. I, gh, coined it: after a country it means the item to follow is about that country, but not transmitted from it, e.g. because of relays or its clandestine nature. It's also handy when multiple or unknown relay or clandestine sites are involved. By definition, this column deals only with broadcast services, i.e. stations with programming for public consumption.*

NETHERLANDS ANTILLES RN's *Radio-Enlace* resumed its proper times, Fri 2303, Sat 0303, 0503.

PERÚ New is R. Diez, Iquitos, 5116.4, evenings and from 1100; plays radio-BINGO. Seems to have scared R. Eco, 5097.4, a non-QSLing station into inviting listeners to come see all the reports they have received! R. Apurímac item, Dec *MT* p. 47 correct frequency is 5235.4, not 5325 (Henrik Klemetz, Colombia, *WOR*) R. Diez asks for reports to Jirón Aguirre 857. R. Naylamp is back on new 4549.5 ex-4300 now occupied by La Voz de Naranjos, after 1000 with hum. R. Apurímac, Abancay, 5235.5 is regular at 1030, 2300-2400+ (Klemetz, HCJB *DXPL*) R. Diez FM, 5116.42, 0930-1036 at great level with Huaynos program, also heard eves, tnx to HK/*WOR* tip (Gifford Pinchot DXpedition, *FT*) R. Luz y Sonido, 6472.1, 0117-0133* (Sheryl Paszkiewicz, WI, HCJB *TLC*) Gonzalo Espinoza, director of R. Eco, Reyes, Bolivia, plans to transfer his station to Puerto Maldonado, Perú, hoping to retain frequency of 4110; due to better economic conditions; also plans another R. Eco in Laberinto del Mismo, Perú (Rolman Medina Méndez, Reyes, Bolivia, *Play-DX*)

PHILIPPINES FEBC resumed *DX Dial*, Wed 1310 on 11995, repeated

Fri 1005 on 11690, Sat 0025 on 15450 (Alok Das Gupta, India, *Australian DX News*)

RUSSIA External services of Adygey Radio, Maykop in Adygey, Arabic, Greek or Turkish, Mon and Fri 1800-1900; and Kabardino-Balkar Radio, Nalchik, in Kabardino, Sun and Wed 1830-1900, which both use transmitters near Krasnodar in the Caucasus, have moved from summer frequency 7305 to new winter outlet 5935 ex-5905, almost completely blocked by Riga here (David Kernick, England)

R. Islamskaya (formerly Rukhi Miras), run by Moscow Islamic Center, heard Friday only on 17890 beneath HCJB from 1550 but clear 1600-1659, said to be in Tatar and //12075 blocked by France (Jerry Berg, MA, *FT*)

R. Al-Risalah, Moscow-based Muslim station, heard at 1500-1600 on 6015 also announcing 6095, on a Monday; had been Mon and Thu only at 0800-0900 last winter (BBCM)

AWR phased out other Russian sites, leaving only Samara, 250 kW: 0300-0600 on 9885, 1700-1900 on 7215 (*Radio News Bulletin*) World University Network, Dr. Gene Scott, *0100-0800+ on 12065, *0800-1300 on 17600, 1300-1600+ on 9835, all good; and around 0645 on 21845, poor (B. L. Manohar, VU2UR, Lucknow, India)

World Christian Broadcasting Corp. 1200-1300 Fri/Sat/Sun in Chinese on Khabarovsk 6165 (Nagoya DX Circle via *ADXN*) That's the same as KNLS, Alaska, which cannot supply info or QSL this, but asks for listener reports (gh)

R. Aum Shinrikyo once used 41 R. Moscow frequencies, was off for a few months, now back at 2030-2100 on most or all VOR frequencies in English including new 4055 (Chris Greenway, BBCM, RN*MN*) But 2030 subsequently just music fill (Bill Westenhaver, PQ) Also try at 0430; see KALININGRAD

SAIPAN Typhoon Wilda, 170 mph, caused heavy damage to KFBS Oct. 25, island power off for days after lightning damaged equipment; staff repaired antennas in next few days (Chris Swabo, FEBC Field Director, HCJB *DX Partyline*) A week later Typhoon Zelda hit Saipan dead center, destroyed all repair work, $100K damage (Jim Bowman, FEBC Dir., *ibid.*) Antennas repaired again, but still no 3-phase power (HCJB *The Latest Catch*) Back on air after two weeks (Swabo, *DXPL*) Checked a few days after Zelda, KHBI was on the air, 9425 at 1230 (Roger Chambers, Mohawk Valley SWL Club DX Camp, NY)

SERBIA (non) R. Yugoslavia in English at 0200-0228* on 6190 ex-6195 (Brian Alexander, PA)

SICILY RAI tech sked shows 7175 and 9515 are 5 kW, not 25; 6060 is 25 kW but for the night program 2300-0500 this frequency comes instead from 100 kW near Rome (Andy Sennitt, RN*MN*)

SLOVAKIA DSWCI's DX program is back on AWR, now from here with high power, Sun 0900-0930 on 9450, 2100-2130 on 6055 (Finn Krone) First week was actually 2122-2136, fair to good; next week only 2129-2137 (gh) Also fair during Sun 0900 broadcast on 9450 (Brian Alexander, PA) Tho phoned in, takes 10 days to get this on the air; trying to decrease delay (Krone, DSWCI) Resumes Jan 15 after holiday break, Finn's SW news except on last Sun of month when I give MW news (Gordon Bennett, Cheshire, WDXC and BDXC) Integrated into new consolidated AWR DX program *Worldscan* from Jan 15 on AWR Slovakia; Jan 1 on KSDA, TIAWR, TGMU and also via WRMI 9955 UT Sun 0100, a week later on HRJA 15695 (sic) Sat 2000; plan to increase to a half-hour network program (Adrian Peterson, AWR via Robert Stessel, USENET via Thurman)

SRI LANKA A clash halting construction at new VOA site was a personal matter, not a protest against VOA; I visited station, saw 3 x 500 kW Marconis in place, being wired, antenna masts under construction, lots of activity (Victor Goonetilleke, RN*MN*)

SUDAN SNBC, 9200 English 1800-1900 with news, IDs, music from Rod Stewart to local Arabic, weak at first, strong by 1900 (Brian Alexander, PA) Also fair in Arabic at 1300 (B.L. Manohar, India.

SWEDEN Because of WYFR on 9850, R. Sweden tried 9895 at 0230 and 0330 (George Thurman, IL) At same times shifted 6200 to 6195 (Brian Alexander, PA) Tried 11695 instead (Harold Sellers, Ont, HCJB) Later tried 7120 at 0230 and 0330, better than 49m (George Thurman, IL, and Bob Thomas, CT)

المديرية العامة لهيئة الإذاعة والتلفزيون
SYRIAN RADIO & TELEVISION

SYRIA Some more SARBS English features on 15095, 12085: *Welcome to Syria*, Sat 2030; *Human Rights*, Sat 2130; *Palestine Talk*, Mon 2045, Wed 2145; *Syria and the World*, Tue 2030, Sat 2145; *Arab Women in Focus*, Thu 2145; *Arab Newsweek*, Fri 2030, 2130 (via Dave Jeffery)

THAILAND Updated R. Thailand World Service sked shows English in addition to last month: 0000-0030 Asia/Africa 9680, 0300-0330 W North America 11890. The non-English, except for IDs, 1300-1400 broadcast to E Asia heard so well last summer on 25 meters is now on 7105 (via Randy Stewart, MO, *WOR*)

UKRAINE RUI keeps changing frequencies; 7180 was best for a while, then replaced by 7405, very strong at 2200-2300 in English //all weak 9620, 7240, 5940, 11870, 4820, 9810, 6055; also at 0100 but mixing VOA (Brian Alexander and Kevin Hecht, PA)

USA VOA's *Communications World* expanded to half an hour, at first announcing contradictory new times, but confirmed on Sat: 1230 on 6110, 9760; 1730 on 15410, 19379; 2130 on 15445--Botswana; not found on any VOA frequency at 0030 UT Sun (gh, *WOR*) Formerly sporadic, *Talk to America* worldwide call-in with Barbara Klein was supposed to début Nov 26, weekdays 1706-1800, playbacks at 1006, 1206 (Kim Andrew Elliott, USENET via Thurman)

WHRI replaced 7315 with 6040 in the 1000-1500 period, propagating much better; another Fri afternoon/evening time was sought for *WORLD OF RADIO* to replace 2300; still UT Sat 0600 on 7315, 9495; new time Sat 1729 on 13760, 15105, also HAWAII, q.v.

KAIJ, Denton TX, began using second transmitter Nov. 4, with 300° antenna, nothing but Dr Gene Scott, 13815 day, 5810 night; Continental 418-E (George McClintock, George Thurman)

KVOH, Los Angeles, replaced 9785 with 7415 evenings at end of Oct, around 0100-0800 (Ed Rausch, NJ) Still 17775 daytime powerhouse (gh)

MRI changed starting time of weekday *Letterbox* segment—Tue-Fri from 0049-0052, repeated hourly; Mon, from 0949 (Jim Moats, OH) Both WSHB transmitters are silent 1400-1600. During that period, MRI can be heard only on KHBI, 9355. KHBI is silent 2000-2100, 0000-0800 (via C. Ed Evans, WSHB, USENET via Thurman)

AWR is not taking the Three Angels Message to China in Mandarin; our message is being gutted (John Osborne, Prophecy Countdown, WCSN)

WRMI, 9955, gradually expands airtime only when it's paid for; adds Brother Stair daily 1400-1500, also Sunday evenings; new French music show Mon-Sat 2300-0100 (via Jeff White, WRMI) See also SLOVAKIA

WMLK, Bethel PA, is upgrading 9465 transmitter, increasing to 100 kW (*Narrow Way Newsletter* via David Ansell, British DX Club)

VANUATU New transmitter site is under construction, two 1 kW, two 10 kW, and relocate old one, target date yearend (Ludo Maes, RN*MN*) Check old SW frequencies for possible reactivation.

YEMEN Rep of Yemen Radio, 9779.77, +1828-1900 in English, news, disco music (Brian Alexander, PA)

ZIMBABWE ZBC Radio 2 back on shortwave, testing evening on 3306 (via Chris Greenway, BBCM, RMNM) And I heard around 2000 on 3396 (Greenway, BBCM, direct)

Until the next, Best of DX and 73 de Glenn!

Log of the Month

January's **LOG OF THE MONTH** is submitted by Jerry Witham of Keaau, Hawaii. Thanks, Jerry!

JAPAN: Radio Japan. Program of Japan's earthquake detection titled, *Acoustic Sensing in Undersea Earthquake Research.* Station ID at 1720, followed by an interview with a Korean man relating his impressions of Japan.

A special thanks to the Maywoods DX Team for loggings from their recent DXpedition in Kentucky.

0002 UTC on 5019.6
COLOMBIA: Ecos del Atrato. Spanish. Weak signal, plagued with poor modulation. Music, and talk to station ID at 0005. (Nick Terrence, Huntington, NY)

0035 UTC on 4915
GHANA: GBC. Station on past scheduled 0000*. Ray Charles classics to African vocal tune. Male announcer in African dialect. Ballad from Jim Reeves to chat. No // programming on 3366, English program notes at 0044 into national news. Hymn to station ID/frequency quote at 0057. Choral national anthem to 0100*. (Gayle VH, Brasstown, NC)

0036 UTC on 6035
BELGIUM: Radio Vlaandaren Intl. National *Press Review.* Station ID, listener's letterbox segment, and European pop music. (Robert Tucker, Savannah, GA)

0111 UTC on 9670
GERMANY: Deutsche Welle. *DXers World Meeting,* followed by *Living in Germany* feature on the differences in the educational system in East and West Berlin. (Tucker, GA)

0115 UTC on 4779.8
GUATEMALA: Radio Cultural Coatán. Spanish. Very weak signal for rustic regional vocals. Evening messages and greetings read by announcer. Station ID and time check. Language possibly could have been an Indian dialect, as quality intermittently faded. (Tom Banks, Dallas, TX)

0132 UTC on 9955
USA: Radio Miami Intl. Spanish programming to lively Latin music. Station ID with poor audio due to splatter from co-channel jammer. (Terrence, NY)

0135 UTC on 3289.9
ECUADOR: **Radio Centro**. Fair signal quality with news and information about Ecuador. Sports chat also noted. (Sam Wright, Biloxi, MS) Ecuador's **Ecos Del Oriente** audible on 3270 at 0315. (Maywoods DX Team: Loy Lee, Oliver Brewer, Ed Shaw, Chuck Everman, Jim McClure, Eric Petty, John Hafendorfer)

0213 UTC on 6190
SERBIA: Radio Yugoslavia. Critical commentary on the Serbs. Biographical sketch of a scientist born in present day Yugoslavia. ID as, "you are tuned to Radio Yugoslavia" Signal SINPO=34533. (Gerald R Brookman, Kenai, AK)

0230 UTC on 21580
PHILIPPINES: **Radyo Pilipinas**. Regional programming from Tinang, heard on // 177840, 17760. Heard daily in Guam. (David A. Norcross, Barrigada, Guam) **Radio Veritas** noted in Japanese, on 9650 at 2210. (Witham, HI)

0243 UTC on 4995
PERU: **Radio Andina**. Spanish. *Very* excited announcer with regional chat and "Andina" IDs. Peruvians audible as; **Frec San Ignacio** on 5700 at 0300; **Radio Horizonte** on 4505 at 1043. (Maywoods DX Team, KY)

0320 UTC on 4991
SURINAME: Radio Apintie. Dutch. Sub-continental music and talk, very low audio mixing with Peruvian Radio Ancash. (Maywoods DX Team, KY)

0343 UTC on 9820
CUBA: **Radio Havana.** *DXers Unlimited* program with Arnie Coro. Noted on // 6010. (Tucker, GA) Station monitored on 17760 at 2150 with report on a new U.S./Cuban telephone link-up. (Fraser, MA) Cuba's **Radio Rebelde** on 5025 at 2110 with Latin ballads and announcers ID. (Maywoods DX Team, KY)

0600 UTC on 9825
KIRIBATI: Regional programming in Kiribatese...very ho hum catch from my location! (Norcross, GUAM) Station audible on 9825 at 0750, with island songs hosted by an articulate lady announcer. Visions of surf and coconuts! (Witham, HI)

0740 UTC on 5040
COLOMBIA: **La Voz de Yopal**. Spanish. Lively Latin tunes interspersed with commercials. News briefs from Bogotá to ID at 0758. (Witham, HI) Colombia's **Radio Ondas del Meta** audible on 4884.3 at 2300. (Terrence, NY) Other Colombians noted: **Caracol Colombia** on 5075 at 0301; **Ecos Del Atrato** on 5020 at 0307; **Ondas Del Meta** on 4855 on 0450. (Maywoods DX Team, KY)

0810 on 5960
NEW ZEALAND: Radio Reading Service. Sports happenings from around the globe. Feature on Australian football to American boxing event. (Witham, HI) Talk radio show on 15115 at 2241. (Terrence, NY; Maywoods DX Team, KY)

0945 UTC on 6135
BOLIVIA: **Radio Santa Cruz**. Spanish. Interval signal to sign-on identification and announcers talk. (Terrence, NY) Bolivia's **Radio Perle Del Acre** monitored on 4600 at 0253. (Maywoods DX Team, KY)

1038 UTC on 2310
AUSTRALIA: **VL8A-Alice Springs**. IDs and pop music program, heard also on // 2310 **VL8T-Tennant Creek.** (Maywoods DX Team, KY) **Radio Australia** heard on 9580 at 1130. Report on photo exhibit *People of the Asian Nations.* (Bob Fraser, Cohasset, MA) Station noted as; 0208 on 17715, 17750, 17795, 17860. (Brookman, AK)

1050 UTC on 4874.6
INDONESIA: **RRI-Sorong**. Indonesian. Male/female announcers chat to pop music program and station ID. Indo's **RRI-Ujung Pandang** noted on 4783 at 1105. Lady DJ's musical interlude, chat and English ID at 1155. (Maywoods DX Team, KY)

1105 UTC on 4890
PAPUA NEW GUINEA: **NBC.** English/Pidgin. U.S. country music to regional items. Additional PNGs: **Radio Manus** on 3315 at 1116; **Radio Eastern Highlands o**n 3395 at 1124. (Maywoods DX Team, KY)

1350 UTC on 13620
KUWAIT: Radio Kuwait. Arabic service to music and "Kuwaiti" ID. (Terrence, NY; John Tinkham, Virginia Beach, VA)

1625 UTC on 3223
INDIA: All India Radio. Hindu. Sub-continental music to a brief announcement and ID at 1630. Station sign-off at 1700. AIR heard on 4840 at 1725 to 1730*. (Witham, HI; Norcross, Guam; Maywoods DX Team, KY)

1657 UTC on 15410.2
USA: WRNO. Rush Limbaugh program monitored to 1732. USB necessary to separate WRNO from possible BBC via Meyerton. Normally dominates frequency, poor to occasional fair with severe heterodyne. (Mike Hardester, Jacksonville, NC)

1728 UTC on 9560
JORDAN: Radio Jordan. Good signal for recordings of the clarinet and strings of Acker Bilk, concluding with *Moon River* tune. North American service ID and sign-off. (James Maharg, Oak Park, IL)

1745 UTC on 6540
NORTH KOREA: Radio Pyongyang. Arabic service to Middle East and Africa. Melodious Korean melody, followed by announcers. Carrier returned at 1758 with an interval signal and Korean ID. Anthem and return to Arabic at 1802. Spanish service noted at 1805 on 6576. (Witham, HI) Usual propaganda on 6576 at 1112. (Maywoods DX Team, KY)

2025 UTC on 11603
ISRAEL: Kol Israel. *DX Corner* show discussing the Israeli-Russian space program proposed. (Fraser, MA; Terrence, NY) Station noted on 7465 at 2020, with *Calling All Listeners* show featuring an interview with Jewish cartoonist Yakov Pilsen. (Fraser, MA; Brookman, AK)

2030 UTC on 9550
RUSSIA: Radio Moscow Intl. Program of Tchaikovsky's music. (Fraser, MA) Noted on 9620, 2143 (Tucker, GA; Brookman, AK)

2155 UTC on 9900
TURKEY: Voice of Turkey. Feature on the history of Palestine during the 1940's. ID at 2158 with poor signal modulation and distorted audio. (Terrence, NY; Brookman, AK)

2207 UTC on 6110
HUNGARY: Radio Budapest. Hungarian *Press Review* to station ID. Folk and pop music selections. (Tucker, GA)

2329 UTC on 4930
HONDURAS: Radio International. Spanish. Music and local commercials. ID as "Radio International" with good signal quality. (Terrence, NY) Station monitored past 0132 with similar programming format. (Banks, TX)

2342 UTC 4782.3
MALI: Rdiff TV Malienne. French. African pops to highlife music. Lady announcer's chat to time check and featured music show (utility QRM at 2345). // 4845 noted under Guatemalan Radio Tezulutlan. (Van Horn, NC)

2345 UTC on 4747.4
PERU: **Radio Huanta 2000.** Tentative logging for station in Huanta. Male/female duo with talk and program feature to commercial jingles. (SIO=323). Two additional Peruvians monitored; **Radio Luz y Sonido** at 2358 on 6472.1. Talk at tune-in to music bridge and ID at 0100. Fair signal with fading. **Radio Ilucan** at 0105 on 5620.9. Spanish newscast battling with amateur radio QRM. Rustic Peruvian ballads to talk, ID/frequency. Tentative ID on **Radio Paucartambo** on 5894.7 at 0100. (Van Horn, NC)

Thanks to our contributors — Have you sent in YOUR logs?
Send to ***Gayle Van Horn,*** *c/o Monitoring Times.*
English broadcast unless otherwise noted.

The QSL Report

Gayle Van Horn

SHORTWAVE BROADCASTING

Is Hawaii in Your QSL collection?

World Harvest Radio International, operator of KWHR shortwave radio, is part of LeSea Broadcasting, founded by evangelist Lester Sumrall. Transmitting near Naalehu, Hawaii (South Point) Hawaii, KWHR took to the airways on Christmas Day 1993. Programming originates in South Bend, Indiana, where the audio is fed to the shortwave transmitters by satellite on Galaxy 4, Transponder 15 on audio subcarriers.

If you have not sent your reception report to receive a colorful QSL card, please send your details to: World Harvest Radio International, c/o Engineering Dept., P.O. Box 50450, Indianapolis, IN 46250.

AIRCRAFT TRAFFIC

New Zealand 1940, (Aircraft ZK-NBA Boeing 767) 6556 kHz. Full data prepared QSL card verified. Received in 13 days for an English utility report. QSL address: c/o Air New Zealand, P.O. Box 73111, Auckland International Airport, Auckland, New Zealand. (Steve McDonald, Port Coquitlam, BC Canada)

ANDAMAN & NICOBAR ISLANDS

All India Radio, 4760 kHz. Full data color AIR card, signed by A.S. Guin, noted with Port Blair transmitter site. Received in 183 days for an English report, and one U.S. dollar. Station address: Directorate General, All India Radio, Akashvani Bhawan, Parliament St., New Delhi 110001 India. (Gayle Van Horn, Brasstown, NC)

CHILE

Radio CBV-Playa Ancha Marine Radio, 8737 kHz. Full data station card signed by German Valdiva Ibarra-Jefe del Centro. Received in 45 days for an English utility report and mint stamps. Station address: Centro de TC Maritim, Subida Carvallo s/n, Valpariso 281022 Chile. (Ed Rausch, Cedar Grove, NJ)

COAST GUARD

NOU-USCG Air Station, 2670 kHz. Full data prepared QSL card signed by W.D. Benning-RM1. Received in 17 days for an English utility report. Station address: c/o Radioman-In-Charge, USCG Air Station, 611 Airport Rd., Sitka, AK 99835. (Mc Donald, CAN)

NMJ1, 2670 kHz. Full data prepared QSL card signed by T.A. Stewart. Received in 10 days for an English utility report. Station address: c/o Commander, 17th CG District, P.O. Box 25517, Juneau, AK 99802-5517. (McDonald, CAN)

NMY42, 2670 kHz. Full data prepared QSL card signed by L.D. Zim-PO. Received in 10 days for an English utility report. Station address: c/o Commander, USCG Group Moriches, 100 Moriches Island Rd., East Moriches, NY 11940. (McDonald, CAN)

NMQ9, 2670 kHz. Full data prepared QSL card signed by Thomas Petit. Full data verification letter enclosed. Received in 10 days for an English utility report. Station address: USCG Group Los Angeles/Long Beach, 165 N. Pico Ave., Long Beach, CA 90802. (McDonald, CAN)

MEDIUM WAVE

WCHY-1290 AM. Partial data letter signed by Martin Foglia, Jr.-Chief Engineer. Coverage maps and station stickers enclosed. Received in 21 days for an AM report, address label (used) and mint stamps. Station address: P.O. Box 1247, Savannah, GA 31402. (Mike Hardester, Jacksonville, NC)

WAVG-970 AM. Full data QSL card signed by Steve Petty-Chief Engineer. Station profile sheet and coverage map enclosed. Received in 8 days for an English AM report and mint stamp. Station address: c/o Sunnyside Communications, Inc., Corporate Offices, P.O. Box 726, Jeffersonville, IN 47130. (Larry Van Horn, Brasstown, NC)

DBS Radio-595 AM. Partial data form letter signed by Fred White, AG-Chief Engineer. Received in 22 days after an English AM follow-up report (total time 153 days), 1 IRC, mint stamps (used) and an address label (used). Station address: Dominica Broadcasting Corp., Victoria St., Roseau, Commonwealth of Dominica. ph# 809-448-3282 or 448-3283/ FAX# 809-448-2918. (Hardester, NC)

NON-DIRECTIONAL BEACONS

N, 316 kHz-Naples, Florida. Full data prepared QSL card verified by D.L. Smith-RM1. Received in 38 days for an English utility report and mint stamps. Station address: c/o Coast Guard Group, 600 8th Ave. SE, St. Petersburg, FL 33701-5099. (Frank Hillton, Charleston, SC)

CI, 400 kHz-Sault Sainte Marie, Michigan. Full data prepared QSL card verified with illegible signature as Manager. Received in 35 days for an English utility report and mint stamps. Station address: Chippewa County International Airport, Sault Sainte Marie, MI. (Tom Banks, Dallas, TX)

SHIP TRAFFIC

Chastine Maersk-OWNJ2, 156.65 MHz (Container Vessel). Full data QSL letter. Received in 151 days for an English utility report and one U.S. dollar. Ship QSL address: c/o Moeller, AP-Esplanaden 50, DK-1098 Copenhagen K., Denmark. (Hank Holbrook, Dunkirk, MD)

Joseph Lykes-3ELQ9, 156.65 MHz (General Cargo/Container) Full data prepared QSL card verified. Received in 82 days for an English utility report and mint stamps. Ship QSL address: Lykes Bros. Steampship Co. Inc., Lykes Center, 300 Poydras St., New Orleans, LA 70130. (Holbrook, MD)

Frederick Lykes-P3JE4, 156.65 MHz (General Container). Full data prepared QSL card verified. Received in 32 days for an English utility report and mint stamps. Ship QSL address: (please refer to *Joseph Lykes* address) (Holbrook, MD)

Charlotte Lykes-WT5T, 14.300 MHz (Container). Full data prepared QSL card verified. Received in 200 days for an English utility report and mint stamps. Ship QSL address: (please refer to *Joseph Lykes* address) (Holbrook, MD)

Chevron Star-ELFT, 156.7 MHz (Motor Tanker). Full data prepared QSL card verified, and photo of vessel. Received in 71 days for an English utility report and mint stamps. Ship QSL address: Chevron Shipping Co., 555 Market St., San Francisco, CA 94105-2870. (Holbrook, MD)

UNITED KINGDOM

GKZ1, 3607.3 kHz. Humber Marine Radio. Full data station card verified. BTI station location/map card and friendly letter. Received in 12 days for an English utility report, address label (used) and a station schedule. Station address: BT Radio Station-Humbar Radio, Sutton Rd., Mablethorpe, Lincolnshire, United Kingdom LN12 2PH. (Hardester, NC)

VANUATU

Radio Vanuatu, 7260 kHz. Full data *Slit-Gong* card, unsigned. Received in 56 days for an English report, 1 IRC and mint stamps. Station address: P.O. Box 49, Port Vila, Rep. of Vanuatu. (Bill Humphries, Knoxville, TN)

How to Use the Shortwave Guide

1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Standard Time) 5, 6, 7 or 8 hours for Eastern, Central, Mountain or Pacific Time, respectively.

Note that all dates, as well as times, are in UTC; for example, the BBC's "John Dunn Show" (0030 UTC Sunday) will be heard on Saturday evening (7:30 pm Eastern, 4:30 PM Pacific) in North America, not on Sunday.

2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours—space does not permit 24-hour listings except for the "Newsline" listing, which begins on the next page.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a rerun, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday T: Tuesday H: Thursday A: Saturday
M: Monday W: Wednesday F: Friday

3: Find the frequencies for the program or station you want to hear.

Look at the page which corresponds to the time you will be listening. Comprehensive frequency information for English broadcasts can be found at the top half of the page. All frequencies are in kHz.

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

4: Choose the most promising frequencies for the time, location and conditions.

Not all stations can be heard and none all the time on all frequencies. To help you find the most promising frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

am: The Americas
na: North America
ca: Central America
sa: South America
eu: Europe
af: Africa
me: Middle East
as: Asia
au: Australia
pa: Pacific
va: various
do: domestic broadcast
om: omnidirectional

Consult the propagation charts. To further help you find the right frequency, we've included charts at the back of this section which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

Hot News and Hot Spots

The world's hot spots always produce an unstable broadcasting environment. This month's reports from Glenn Hauser cover the globe. Closest to home: after Aristide returned to **HAITI** his Radio 16 Desanm continued via Radio Miami Int'l, via WHRI 9495 at 2200, and via WRNO 7355 at 2300 weekdays. It's also on R. Soleil in Haiti.

• On another island on the other side of the world, **PAPUA NEW GUINEA** Government's R. United Bougainville at Loloho began Feb. 18, 1994, on 3880; a reply from the station to Nobuyoshi Aoi (mentioned on R. Japan's *Media Report*) says daytime frequency is 6010; there is no fixed schedule but night around 0800-1200 on 3880, linear with 70 watts output. The address is R.U.B., Public Awareness Campaign Unit, Military Base and Care Centre, East Coast of Central Bougainville, Loloho, PNG.

• In the Middle East, **IRAN's** Voice of the Independent Republic of Iran (VOIRI) replaced 11965 with 7260 //9022 including English at 1930-2030 UT (RVI *Radio World*) 7260, ex-11965, mixes with Australia; it is also targeted to North America *0027-0125 on new 9670, with fair reception until Deutsche Welle covers it at 0054, // weak 9022, 7100 (Brian Alexander, PA, *WOR*)

The Voice of Human Rights and Freedom for Iran (non) official sked: 0230-0425 on 9350, 11470, 15145 but heard on 9350 only; 0600-0640 on 9350, 11650, but heard on 9255, 15150; 1545-1620 on 9350 and 11650; 1630-1825 on 9350, 11470, 15620 (Rumen Pankov, Bulgaria via Büschel)

A picture from earlier days (1988) of Tom Meyer and Rosemarie Ninaber hosting Radio Netherland's **Happy Station.** *Neither person is now associated with the show, according to Steven Cline, who contributed the photo. He says RN announced last fall that Rosmarie was being reassigned to the Dutch service.*

The Voice of the Islamic Revolution in **IRAQ**, which is Iran-based, was heard at 1600 on new 8340 //7115, 9670; also *1430 on 7115. The same organization runs V. of Rebellious Iraq, blocked by jamming on 7070 1500-1720 (BBCM)

• On the continent of Africa, **ETHIOPIA**'s Voice of Peace, Box 1631, Addis Ababa, is heard daily 0400-0500 on 9560. This humanitarian service for Rwanda opens and closes with an English announcement. (Arthur Cushen, NZ) The station is also known as R. Amahoro; received fairly good at 0358 sign-on with a nice xylophone interval signal (Dave Valko, PA, *FT*)

The Voice of Ethiopian People for Peace, Democracy, and Freedom, (non) signs on in Amharic at 0328 with a flute interval signal on 6940 (Gifford Pinchot DXpedition, PA, *FT*)

Radio Mogadishu, the pro-Aydid Voice of the **SOMALI** People, heard on 6870v, has extended its schedule to 0330-0500 (Fri 0400-0600), 0900-1300, 1500-1900 including news in English 1230-1240, 1830-1840 (BBCM) Finn Krone of AWR DX reports English news at 1245-1255. Rich D'Angelo reported in *Fine Tuning* hearing the Koran at 0334-0348.

What's in a name? Two separate Renamo stations are now found in **MOZAMBIQUE**: Voz do Sonho, from Gorongosa, Sofala, formerly called Voz da Renamo, is heard at 0500-0645 on 6100 (also announces 6175). The name apparently refers to Renamo leader Afonso Dhlakama's "dream" of bringing democracy to Mozambique. And, from Maputo, Voz da Renamo, 1440-1530 is broadcast in Portuguese and Ndau on 7135 (BBCM)

MT Monitoring Team

Gayle Van Horn, Frequency Manager
North Carolina

Dave Datko
California

Next Reporting Deadline
January 18, 1995

Jim Frimmel, Program Manager
Texas

Jacques d'Avignon
Propagation Forecasts
Ontario, Canada

newsline

"Newsline" is your guide to news broadcasts on the air. • All broadcasts are world news reports unless followed by an asterisk, which means the broadcast is primarily national news. • All broadcasts are daily unless otherwise noted by the day codes.

0000 UTC
(7:00 PM EST, 4:00 PM PST)
BBC
Canada (North-Quebec) [S]
China Radio Int'l
Monitor Radio Int'l [T-A]
Radio Australia
Radio Bulgaria
Radio Canada Int'l [S-M]
Radio New Zealand Int'l [M-A]
Radio Norway Int'l [S]
Radio Prague
Radio Thailand
Radio Yugoslavia [M-A]
Spanish National Radio
Voice of America (am)
Voice of Russia
WYFR [T-F]
0003
Radio Pyongyang
0009
BBC*
China Radio Int'l*
0010
Voice of America (ca) [T-A]*
0015
Radio Cairo
0030
Netherlands (na)
Radio Nacional de Venezuela [T-S]
Radio Netherlands Int'l
Radio New Zealand Int'l [M-F]
Radio Sweden [T-A]
Radio Thailand [T-S]
Radio Vlaanderen Int'l
Voice of America (am) [T-S] (Special English)
Voice of America (as) (Special English)
Voice of America (ca) [S] (Special English)
Voice of Russia
0050
RAI Italy

0100 UTC
(8:00 PM EST, 5:00 PM PST)
All India Radio
BBC
Canada (North-Quebec)
Deutsche Welle
FEBC (Philippines)
HCJB
KVOH [W]
Monitor Radio Int'l [T-A]
R Slovakia Int'l [A]*
R Slovakia Int'l [S/T-F]
Radio Australia
Radio Havana Cuba [T-S]
Radio Japan
Radio Korea
Radio New Zealand Int'l [M-A]
Radio Prague
Radio Tashkent
Radio Ukraine Int'l
Radio Yugoslavia [M-A]
Spanish National Radio
Swiss Radio Int'l
Voice of America (am)
Voice of Indonesia
Voice of Russia
0110
Radio Australia [M-F]*
Radio Japan [A]*
0130
BBC (as) [T-A]*
Radio Austria Int'l
Radio Havana Cuba [T-A]
Radio Netherlands Int'l
Radio Sweden [T-A]
Radio Tirana
Voice of Greece
Voice of Russia
0145
BBC (ca) [T-A]*
0155
Vatican Radio [S-W-F]
Voice of Indonesia

0200 UTC
(9:00 PM EST, 6:00 PM PST)
BBC
Canada (North-Quebec) [S]
Deutsche Welle
Monitor Radio Int'l [T-A]
Radio Australia
Radio Budapest
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio New Zealand Int'l [M-A]
Radio Norway Int'l [M]
Radio Romania Int'l
Radio Yugoslavia
Voice of America (am) [T-A]
Voice of America (as)
Voice of Myanmar (Burma)
Voice of Russia
0203
Voice of Free China
0215
Radio Cairo
Radio Nepal
0230
Radio Havana Cuba [T-A]
Radio Netherlands Int'l
Radio Pakistan
Radio Portugal Int'l [T-A]
Radio Sweden [T-A]
Radio Tirana
Voice of Russia [T-A]

0300 UTC
(10:00 PM EST, 7:00 PM PST)
BBC
Canada (North-Quebec)
China Radio Int'l
Deutsche Welle
KVOH [T-A]
Monitor Radio Int'l [T-A]
Radio Australia
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio Japan
Radio New Zealand Int'l [M-A]
Radio Prague
Radio Thailand
Voice of America (af) [A-S]
Voice of Russia
WHRI [T-S]
WINB [T-A]
WWCR #3 [T-A]
0301
Voice of America (af) [M-F]*
0303
Voice of Free China
0309
BBC*
China Radio Int'l*
0315
Radio Cairo
Voice of Greece [S/H]
0320
Radio Philipinas [M-A]
Vatican Radio
0330
BBC (af)*
Netherlands (na)
Radio Austria Int'l
Radio Budapest
Radio Dubai
Radio Havana Cuba [T-A]
Radio Nacional de Venezuela [T-S]
Radio Prague
Radio Sweden [T-A]
Voice of America (af) [M-F] (Special English)
Voice of Russia
0340
Voice of Greece
0355
Radio Japan

0400 UTC
(11:00 PM EST, 8:00 PM PST)
BBC
BBC (af)
Canada (North-Quebec)
Channel Africa
China Radio Int'l
Deutsche Welle
Monitor Radio Int'l [T-F]
Radio Australia
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio New Zealand Int'l [A]
Radio New Zealand Int'l [M-F]*
Radio Romania Int'l
Radio Tanzania
Radio Ukraine Int'l
Swiss Radio Int'l
Voice of America (af)
Voice of Russia
Voice of Turkey
WHRI [T-A]
WINB [T-A]
0403
Radio Pyongyang
0409
China Radio Int'l*
0411
Channel Africa [T]
0425
RAI Italy
0430
Channel Africa [A]
Radio Havana Cuba [T-A]
Voice of Russia
0431
Channel Africa [T/H/F]
Voice of America (af) [M-F]*
0440
BBC (af) [A-M]*
0445
BBC (af) [T-F]*
Radio Yerevan

0500 UTC
(12:00 AM EST, 9:00 PM PST)
BBC ("Newshour")
Canada (North-Quebec)
Channel Africa
China Radio Int'l
Deutsche Welle
HCJB
Monitor Radio Int'l [T-F]
Radio Australia
Radio Bulgaria
Radio Cameroon
Radio Havana Cuba [T-S]
Radio Japan
Radio New Zealand Int'l [S-F]
Radio Norway Int'l [S]
Spanish National Radio
Vatican Radio [T/F]
Voice of America (af)
Voice of Israel
Voice of Russia
WHRI [A]
0509
China Radio Int'l*
0510
Radio Australia [M-F]*
0530
Channel Africa [S-F]
Radio Austria Int'l
Radio Dubai
Radio Finland
Radio Havana Cuba [T-A]
Radio Romania Int'l
Voice of Nigeria
Voice of Russia
0555
Radio Japan [A]

0600 UTC
(1:00 AM EST, 10:00 PM PST)
BBC
BBC (af) [A-S]*
BBC (af) [M-F]
Canada (North-Quebec)
Channel Africa
Deutsche Welle
Monitor Radio Int'l [T-F]
Radio Australia
Radio Canada Int'l [M-F]
Radio Havana Cuba [T-S]
Radio Japan
Radio Korea
Radio New Zealand Int'l
Radio Yemen
Swiss Radio Int'l
Swiss Radio Int'l (eu)
Voice of America (af) [A-S]
Voice of America (me)
Voice of Kenya
Voice of Malaysia
Voice of Russia
0601
Voice of America (af) [M-F]*
0603
Radio Pyongyang
0609
BBC*
0627
BBC (af) [M-F]*
0630

Radio Austria Int'l [T-S]
Radio Havana Cuba [T-A]
Radio Yemen
Vatican Radio [H]
Voice of Nigeria [M-F]
Voice of Russia
0632
Radio Romania Int'l
0640
Vatican Radio [T]
0645
Radio Romania Int'l
Voice of Nigeria [M-F]*
0655
Voice of Med. (Malta) [M-F]

0700 UTC
(2:00 AM EST, 11:00 PM PST)
BBC
Monitor Radio Int'l [T-F]
Papua New Guinea
Radio Australia
Radio Japan
Radio New Zealand Int'l [A]
Radio New Zealand Int'l [M-F]*
Radio Prague
Swiss Radio Int'l (eu)
Voice of Myanmar (Burma)
Voice of Russia
WWCR #1 [S-H]
0703
Radio Pyongyang
Voice of Free China
0705
Radio New Zealand Int'l [M-F]*
0710
Radio Australia [M-F]*
0730
BBC (af) [A]*
HCJB
Radio Netherlands Int'l
Radio Pakistan
Radio Prague
Radio Vlaanderen Int'l
Vatican Radio [M-F]
Voice of Greece [S/H]
Voice of Russia
0750
[A]
Radio New Zealand Int'l [M-F]*
0755
Radio Japan
Voice of Med. (Malta) [M-F]

0800 UTC
(3:00 AM EST, 12:00 AM PST)
BBC
KNLS
Monitor Radio Int'l [M-A]
Radio Australia
Radio Korea
Radio New Zealand Int'l
Radio Pakistan
Voice of Indonesia [A-H]
Voice of Malaysia
Voice of Russia
0803
Radio Pyongyang
0810
Radio New Zealand Int'l [M-F]*
0830
R Slovakia Int'l
Radio Austria Int'l [T-S]
Radio Netherlands Int'l
Voice of Russia [M-A]
0845
Radio Finland
0855
Voice of Indonesia [A-H]

0900 UTC
(4:00 AM EST, 1:00 AM PST)
BBC
China Radio Int'l
Deutsche Welle
Monitor Radio Int'l [M-A]
Papua New Guinea [M]*
Radio Australia
Radio Finland
Radio Japan
Radio New Zealand Int'l [M-A]
Swiss Radio Int'l
Voice of Russia
0909
China Radio Int'l*
0920
Voice of Greece [S/H]
0930
FEBC (Philippines)
Radio Netherlands Int'l
Radio Yerevan [S]
Voice of Russia
0940
Voice of Greece
0945
Deutsche Welle [M-F]*
0955
Radio Japan

1000 UTC
(5:00 AM EST, 2:00 AM PST)
BBC
China Radio Int'l
FEBC (Philippines) [M-F]*
HCJB
Monitor Radio Int'l
Papua New Guinea
Radio Australia
Radio Bulgaria
Radio New Zealand Int'l [S-F]
Radio Tanzania
Radio Vlaanderen Int'l [M-A]
Voice of America (as)
Voice of Kenya
Voice of Russia
1009
China Radio Int'l*
1010
Radio New Zealand Int'l [M-F]*
1030
Radio Austria Int'l [M-A]
Radio Dubai
Radio Netherlands Int'l
Voice of Nigeria
Voice of Russia
1045
Radio New Zealand Int'l [M-F]*
Voice of Nigeria [A-S]*

1100 UTC
(6:00 AM EST, 3:00 AM PST)
BBC
Channel Africa
Deutsche Welle
Monitor Radio Int'l [M-A]
Papua New Guinea
Radio Australia
Radio Ghana [A-S]
Radio Japan
Radio Jordan
Radio Mozambique
Radio New Zealand Int'l
Radio Pakistan
Radio Singapore Int'l
Swiss Radio Int'l
Swiss Radio Int'l (eu)
Voice of America (as)
Voice of America (ca)
Voice of Israel
Voice of Russia
WHRI [A]
WWCR #1 [M-F]
WYFR [M-A]
1103
Radio Pyongyang
1110
Radio Australia*
1120
Vatican Radio [M-A]
1130
Radio Korea
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int'l
Radio Prague
Radio Singapore Int'l
Voice of Asia
Voice of Russia
WYFR [M-F]
1145
Deutsche Welle [M-F]*
1155
Radio Japan [M-F]

1200 UTC
(7:00 AM EST, 4:00 AM PST)
BBC
Canada (North-Quebec) [A-S]
China Radio Int'l
Monitor Radio Int'l [M-A]
Papua New Guinea
Radio Australia
Radio France Int'l
Radio New Zealand Int'l [H-T]
Radio Norway Int'l [S]
Radio Singapore Int'l
Radio Tashkent
Swiss Radio Int'l (eu)
Voice of America (as)
Voice of Russia
WHRI [A]
WYFR [M-F]
1203
Radio Korea
Voice of Free China
1204
HCJB [M-F]
1209
BBC [W]*
China Radio Int'l*
1230
HCJB [M-F]*
Radio Austria Int'l
Radio Bangladesh [S-M]
Radio Bulgaria
Radio Cairo
Radio Canada Int'l
Radio Finland [M-A]
Radio Netherlands Int'l
Radio Singapore Int'l
Radio Sweden [M-F]
Voice of Russia
Voice of Vietnam
WYFR [M-F]
1231
Radio France Int'l [T]*
1240
Voice of Greece

1300 UTC
(8:00 AM EST, 5:00 AM PST)
BBC ("Newshour")
Canada (North-Quebec) [A-S]
China Radio Int'l
KNLS
Monitor Radio Int'l [M-A]
Papua New Guinea
Polish Radio [A]
Polish Radio [M-F]*
Radio Australia
Radio Canada Int'l [M-F]
Radio Ghana
Radio Korea
Radio Norway Int'l [S]
Radio Romania Int'l [M-A]
Radio Singapore Int'l
Radio Tanzania [A-S]
Radio Tashkent [S]
Swiss Radio Int'l
Voice of America (as)
Voice of Kenya
Voice of Russia
WYFR [M-F]
1301
Radio Romania Int'l [S]
1303
Radio Pyongyang
1309
China Radio Int'l*
1310
Radiobrás [M-F]
1324
HCJB [M-F]
1328
Radio Cairo
1330
All India Radio
FEBC (Philippines)
Radio Austria Int'l
Radio Canada Int'l
Radio Dubai
Radio Finland
Radio Netherlands Int'l
Radio Singapore Int'l [S-F]
Radio Sweden [M-F]
Radio Tashkent [M-A]
Radio Vlaanderen Int'l [S]
Radio Yugoslavia
Voice of America (as) (Special English)
Voice of Russia [M-A]
Voice of Turkey
Voice of Vietnam
1355
Radio Singapore Int'l

1400 UTC
(9:00 AM EST, 6:00 AM PST)
All India Radio [M/W/F]
BBC
BBC (as) [M-F]*
Canada (North-Quebec) [S]
China Radio Int'l
Monitor Radio Int'l [M-A]
Radio Australia
Radio Cameroon
Radio Canada Int'l [S]
Radio France Int'l
Radio Ghana
Radio Japan
Radio Jordan [A]
Radio Korea
Radio Vlaanderen Int'l [M-A]
Voice of America (as)
Voice of Israel [S-H]
Voice of Russia
WWCR #1 [M-F]
WYFR [M-F]
1409
China Radio Int'l*
1410
Radio Japan [M-F]*
1415
Radio Nepal
1424
HCJB [M-F]
1430
FEBC (Philippines)
Radio Canada Int'l
Radio Finland
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int'l
Radio Romania Int'l [T-S]
Radio Sweden [M-F]
RTM Morocco [S]
Voice of Myanmar (Burma)
Voice of Russia
1431
Radio France Int'l [T]*
Radio Romania Int'l [M]
1435
Voice of Greece
1440
FEBC (Philippines) [S-F]*
1445
BBC (as) [M-F] (Special English)
Voice of Myanmar (Burma)
1450
All India Radio
1455
All India Radio
Radio Japan [A]
Voice of Med. (Malta) [M-F]

1500 UTC
(10:00 AM EST, 7:00 AM PST)
BBC
BBC (af) [M-F]
Canada (North-Quebec) [A-S]
Channel Africa
China Radio Int'l
Deutsche Welle
Monitor Radio Int'l [M-A]
Radio Australia
Radio Canada Int'l [S]
Radio Japan
Radio Jordan
Radio Omdurman
Swiss Radio Int'l
Voice of America (as)
Voice of Russia
WWCR #1 [M-F]
WYFR [A]
1503
Radio Pyongyang
1509
China Radio Int'l*
1510
Radio Japan [M-F]*
1525
BBC (af) [S]*
Radio Veritas [T-F]
1529
Deutsche Welle [H]*

1530
All India Radio
Deutsche Welle [M-W/F]*
FEBC (Philippines)
Radio Austria Int'l
Radio Netherlands Int'l
Radio Portugal Int'l [M-F]
Voice of Nigeria [M-H]
Voice of Russia
WYFR [M-F]
1540
Radio Veritas [A-M]
1550
Voice of Med. (Malta) [F]
1555
Radio Japan [A]
Radio Veritas [A-M]
Voice of Med. (Malta) [M-H]

1600 UTC
(11:00 AM EST, 8:00 AM PST)
BBC
Canada (North-Quebec) [A-S]
Channel Africa
China Radio Int'l
Deutsche Welle
Monitor Radio Int'l [M-A]
Polish Radio [A]
Polish Radio [M-F]*
Radio Australia
Radio Canada Int'l [S]
Radio France Int'l
Radio Jordan
Radio Korea
Radio Pakistan
Radio Tallinn [M-F]
Radio Tanzania
Voice of America (af) [A-S]
Voice of America (as)
Voice of Ethiopia
Voice of Kenya
Voice of Russia
WRNO [W]
WYFR [A]
1604
HCJB [M-F]
1609
BBC*
China Radio Int'l*
1611
Radio France Int'l [T]*
1612
Vatican Radio
1630
HCJB [M-F]*
Radio Canada Int'l
Radio Dubai
Voice of America (af) [M-F]*
Voice of America (as) [S-F] (Special English)
Voice of America (me) (Special English)
Voice of Ethiopia
Voice of Russia
1645
BBC (as)*

1700 UTC
(12:00 PM EST, 9:00 AM PST)
BBC
BBC (af)
Canada (North-Quebec) [A]
Channel Africa
China Radio Int'l
HCJB
Monitor Radio Int'l [M-A]
Radio Australia
Radio Japan
Radio New Zealand Int'l [M-F]*
Radio Pakistan
Radio Prague
Radio Tirana
Swiss Radio Int'l
Voice of America (af)
Voice of America (me)
Voice of Russia
WRNO [M-F]
WWCR #3 [M-F]
1703
Radio Pyongyang
1709
China Radio Int'l*
1710
Radio Australia*
1715
Radio Sweden [M-F]
Vatican Radio
1725
Radio New Zealand Int'l [F]*
1730
Radio Netherlands Int'l
Radio Romania Int'l
Vatican Radio [F]
Voice of America (af) [S]
Voice of Russia [S-F]
1740
BBC (af)*
1745
All India Radio
Radio Canada Int'l [M-F]
1755
Radio Japan [A]
Radio New Zealand Int'l [M-H]*

1800 UTC
(1:00 PM EST, 10:00 AM PST)
All India Radio
BBC
Canada (North-Quebec) [A]
Monitor Radio Int'l [M-A]
Polish Radio [A]
Polish Radio [M-F]*
Radio Australia
Radio Cameroon
Radio Mozambique
Radio New Zealand Int'l [M-F]*
Radio Norway Int'l [S]
Radio Omdurman
Radio Prague
Radio Tanzania
Radio Yemen
Voice of America (af) [A-S]
Voice of America (af) [M-F]*
Voice of America (me)
Voice of Kenya
Voice of Russia
WWCR #3 [M-F]
1805
Radio New Zealand Int'l [M-F]*
1815
Radio Bangladesh
1830
Radio Kuwait
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int'l
Radio Sweden [M-F]
Radio Yemen
Voice of America (af) [A-S] (Special English)
Voice of America (me) (Special English)
Voice of Russia
1835
Radio New Zealand Int'l [F]*
1840
Voice of Greece [M-A]
1855
Radio New Zealand Int'l [M-H]*
1857
BBC (af) [M-F]*

1900 UTC
(2:00 PM EST, 11:00 AM PST)
All India Radio [W]
BBC
China Radio Int'l
Deutsche Welle
Monitor Radio Int'l [M-A]
Radio Australia
Radio Bulgaria
Radio Japan
Radio New Zealand Int'l
Radio Portugal Int'l [M-F]
Radio Romania Int'l [T-S]
Radio Tirana
Radio Vlaanderen Int'l
Spanish National Radio
Voice of America (af)
Voice of America (as)
Voice of Greece [M-A]
Voice of Russia
WHRI [M-F]
WINB [M-F]
WWCR #1 [S-F]
1901
Radio Romania Int'l [M]
1909
China Radio Int'l*
1910
All India Radio [W]
Radio Australia [M-F]*
1930
BBC (af) [S]*
Deutsche Welle [T-F]*
R Slovakia Int'l
Radio Austria Int'l
Radio Netherlands Int'l
Radio Yugoslavia
Voice of Russia
1933
Deutsche Welle [M]*
1935
RAI Italy
1955
Radio Japan [T-W/S]

2000 UTC
(3:00 PM EST, 12:00 PM PST)
BBC
China Radio Int'l
Deutsche Welle
KVOH [A-S]
Monitor Radio Int'l [M-A]
Radio Australia
Radio Budapest
Radio New Zealand Int'l [S-F]
Radio Norway Int'l [S]
Radio Portugal Int'l [M-F]
Radio Tallinn [M/H]
Swiss Radio Int'l
Swiss Radio Int'l (eu)
Vatican Radio [M-T]
Voice of America (af) [A-S]
Voice of America (af) [M-F]*
Voice of America (me)
Voice of Indonesia
Voice of Israel
Voice of Nigeria [M-F]
Voice of Russia
WHRI [M-F]
WINB [M-F]
WWCR #3
2003
Radio Pyongyang
2007
Radio Damascus [M-F]
2009
China Radio Int'l*
2010
Radio New Zealand Int'l [S-H]*
2025
RAI Italy
2030
Polish Radio [A-S]
Polish Radio [M-F]*
Radio Finland
Radio Korea
Radio Netherlands Int'l
Radio Sweden [M-F]
Radio Thailand
Voice of Russia [A-S]
2045
All India Radio [A]
Radio Yerevan
2055
Voice of Indonesia [M]
2057
Radio Kuwait

2100 UTC
(4:00 PM EST, 1:00 PM PST)
All India Radio
BBC ("Newshour")
China Radio Int'l
Deutsche Welle
KVOH [S]
Monitor Radio Int'l [M-A]
Radio Australia
Radio Cameroon
Radio Canada Int'l
Radio Damascus [F]
Radio Havana Cuba [M-A]
Radio Japan
Radio New Zealand Int'l [A-H]
Radio Prague
Radio Romania Int'l
Spanish National Radio
Voice of America (as)
Voice of Russia
Voice of Turkey
WHRI [M-F]
WINB [M-F]
WWCR #3 [S-F]
2109
China Radio Int'l*
2110
Radio Damascus [S-M]
Radio New Zealand Int'l [S-H]*
2112
Radio Damascus [F]
2115
BBC (ca) [M-F]*
Radio Damascus [T]
2120
Radio Cairo
2130
Radio Austria Int'l
Radio Cairo
Radio Canada Int'l [A-S]
Radio Havana Cuba [W]
Radio Nacional de Venezuela [M-A]
Radio Riga Int'l [M-F]
Voice of Russia
2145
Radio Damascus [W]
Radio Korea
2155
Radio Canada Int'l [M-F]
Radio Japan [A]

2200 UTC
(5:00 PM EST, 2:00 PM PST)
All India Radio
BBC
Canada (North-Quebec) [A-S]
China Radio Int'l
Monitor Radio Int'l [M-A]
Radio Australia
Radio Budapest
Radio Bulgaria
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Korea
Radio New Zealand Int'l
Radio Prague
Radio Ukraine Int'l
Radio Vlaanderen Int'l [M-F]
Radio Yugoslavia
RAI Italy
Voice of America (as)
Voice of Russia
2203
Voice of Free China
2209
China Radio Int'l*
2215
All India Radio [M/W/F]
Radio Cairo
2230
Radio Sweden [M-F]
Radio Yerevan
Voice of America (as) (Special English)
Voice of Israel
Voice of Russia [M-F]
2240
Radio Cairo
Voice of Greece [S-F]

2300 UTC
(6:00 PM EST, 3:00 PM PST)
BBC
Monitor Radio Int'l [M-A]
Radio Australia
Radio Canada Int'l
Radio Japan
Radio New Zealand Int'l
Voice of America (as)
Voice of Russia
Voice of Turkey
WWCR #3 [S]
2303
Radio Pyongyang
2315
Radio Cairo
2330
Netherlands (na)
Radio Canada Int'l [A]
Radio Finland
Radio Sweden [M-F]
Radio Yerevan
SLBC (Sri Lanka) [M]
Voice of Russia
2335
Voice of Greece [S-F]
2355
Radio Japan

0000 UTC SHORTWAVE GUIDE 7:00 PM EST 4:00 PM PST

FREQUENCIES

0000-0100	Australia, ADF Radio	18735as			
0000-0030	Australia, Radio	9610as	13745as	17750as	
0000-0100 vl	Australia, VL8A Alice Spg	4835do			
0000-0100 vl	Australia, VL8K Katherine	5025do			
0000-0100 vl	Australia, VL8T Tent Crk	4910do			
0000-0100	Bulgaria, Radio	7205na	9700na		
0000-0015	Cambodia, Natl Voice of	11940as			
0000-0100 vl	Canada, CBC N Quebec Sce	9625do			
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZN St John's	6160do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	Canada, RCI Montreal	5960na	9755na		
0000-0100	China, China Radio Intl	9710na	11715na		
0000-0100	Costa Rica, AWR Alajuela	5030ca	6150sa	9725na	
0000-0100	Cuba, Radio Havana Cuba	6000na			
0000-0027	Czech Rep, Radio Prague	5930na	7345na		
0000-0030	Egypt, Radio Cairo	9900na			
0000-0100	Ghana, Ghana Broadc Corp	3366do	4915do		
0000-0030 vl	Guatemala, AWR	5980ca			
0000-0045	India, All India Radio	9705as	9950as	11745as	13750as
		15145as			
0000-0100 vl	Italy, IRRS Milan	7125eu			
0000-0100	Lebanon, Wings of Hope	9960me			
0000-0030 sm	Lithuania, Radio Vilnius	7150na			
0000-0005 twtfa	Lithuania, Radio Vilnius	7150na			
0000-0100	Malaysia, Radio	7295do			
0000-0100	Malaysia, RTM Kuching	7160do			
0000-0100	Malaysia, RTM/Kota Kinaba	5980do			
0000-0030	Netherlands, Radio	6020na	6165na		
0000-0100	New Zealand, R NZ Intl	15115pa			
0000-0050	North Korea, R Pyongyang	11335na	13760na	15130na	
0000-0030 m	Norway, Radio Norway Intl	6115sa	6120na		
0000-0100 mtwhfa	Palau, KHBN/Voice of Hope	11980as			
0000-0100 vl	Papua New Guinea, NBC	9675do			
0000-0100	Philippines, FEBC/R Intl	15450as			
0000-0100	Russia, Voice of	9750na	11750na	15425na	17570as
		17890as			
0000-0030 mtwhfa	Serbia, Radio Yugoslavia	9580na	11870na		
0000-0100	Spain, R Exterior Espana	9540na			
0000-0100	United Kingdom,BBC London	5965as	5975na	6175na	7325na
		9580as	9590na	9915na	11750sa
		15310as	15360as		
0000-0100	USA, KAIJ Dallas TX	13740na	13815am		
0000-0100	USA, KTBN Salt Lk City UT	7510na			
0000-0100	USA, KVOH Los Angeles CA	7415am			
0000-0100	USA, KWHR Naalehu HI	17510as			
0000-0100	USA, Monitor Radio Intl	7535na	9430na		
0000-0100	USA, VOA Washington DC	5995am	6130am	7215as	7405am
		9455am	9770as	9775am	9890as
		11580am	11695am	11760as	15120am
		15185au	15205am	15290as	17735as
		17820as			
0000-0100	USA, WCSN Scotts Cor ME	9855eu			
0000-0100	USA, WEWN Birmingham AL	5825eu	7425na	9985sa	
0000-0100	USA, WHRI Noblesville IN	7315am	9495am		
0000-0100	USA, WINB Red Lion PA	11950na			
0000-0100	USA, WJCR Upton KY	7490na	13595na		
0000-0100 mtwtf	USA, WRMI/R Miami Intl	9955am			
0000-0100	USA, WRNO New Orleans LA	7355am			
0000-0100	USA, WWCR Nashville TN	5065am	7435am	13845am	
0000-0044	USA, WYFR Okeechobee FL	6085na			
0015-0030 sm	USA, VOA Washington DC	11835am	15155am		
0030-0100	Australia, Radio	13605as	13745as	13755as	15365pa
		15415as	17795pa	17860pa	
0030-0055	Belgium, R Vlaanderen Int	9930sa			
0030-0100	Ecuador, HCJB Quito	9745am	12005am	17490eu	21455eu
0030-0100	Iran, VOIRI Tehran	7100na	9022na	11790na	
0030-0100	Netherlands, Radio	5905as	6020na	6165na	7305as
		9840na	11655na		
0030-0100	Russia, Voice of	7105na	7165na		
0030-0100	Sri Lanka, SLBC Colombo	15425as			
0030-0100	Sweden, Radio	6065sa	6200sa		
0030-0100	Thailand, Radio	9655as	11845af	11905as	
0030-0100 m	USA, WRMI/R Miami Intl	9955am			
0045-0100	USA, WYFR Okeechobee FL	6065na			
0050-0100	Italy, RAI Rome	9645na	11800na		

SELECTED PROGRAMS

Sundays

0007 Radio Canada Int'l: The Inside Track. A sports feature magazine.
0025 Radio Netherlands (na): EuroPress Review. Five-minutes of EuroPress news.
0037 Radio Netherlands (na): Newsline. Correspondent reports, interviews, and commentaries on current events.
0037 Radio Netherlands: Newsline. Correspondent reports, interviews, and commentaries on current events.
0052 Radio Netherlands: Sounds Interesting. Listener feedback and the signts and sounds of Holland.
0053 Radio Netherlands (na): Sounds Interesting. Listener feedback and the signts and sounds of Holland.

Mondays

0004 Radio Canada Int'l: Tapestry. A musical magazine program.
0025 Radio Netherlands (na): Music Break. Five-minutes of music at the end of an hour's program.
0036 Radio Netherlands (na): Happy Station. Jonathan Groubert hosts this 65 year old program of family entertainment.
0036 Radio Netherlands: Happy Station. See S 0137.

Tuesdays

0000 Radio Canada Int'l: As It Happens. See M 2330.
0008 Radio Netherlands (na): From Sapphire to Laser. NEW! Robert Green takes an issue and illustrates how composers have tackled the subject.
0025 Radio Netherlands (na): Press Review. Summary of items in the Dutch media.
0037 Radio Netherlands (na): Newsline. See S 0037.
0037 Radio Netherlands: Newsline. See S 0037.
0052 Radio Netherlands (na): Research File. A program of science and technology.
0052 Radio Netherlands: Research File. See M 1152.

Wednesdays

0000 Radio Canada Int'l: As It Happens. See M 2330.
0025 Radio Netherlands (na): Press Review. See T 0025.
0037 Radio Netherlands (na): Newsline. See S 0037.
0037 Radio Netherlands: Newsline. See S 0037.
0052 Radio Netherlands (na): Mirror Images. Weekly magazine of music, the arts, culture, and European festivals.
0052 Radio Netherlands: Mirror Images. See T 1152.

Thursdays

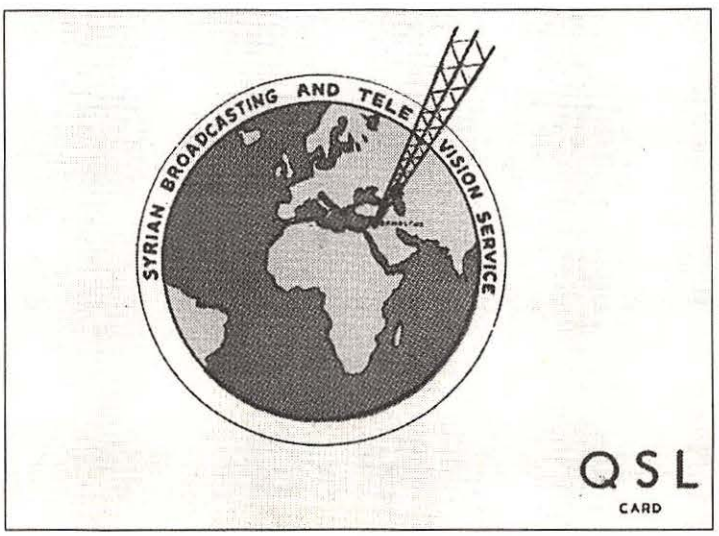
0000 Radio Canada Int'l: As It Happens. See M 2330.
0025 Radio Netherlands (na): Press Review. See T 0025.
0037 Radio Netherlands (na): Newsline. See S 0037.
0037 Radio Netherlands: Newsline. See S 0037.
0054 Radio Netherlands (na): Documentary. An in-depth treatment of one subject or a short series.
0054 Radio Netherlands: Documentary. See W 1154.

Fridays

0000 Radio Canada Int'l: As It Happens. See M 2330.
0025 Radio Netherlands (na): Press Review. See T 0025.
0037 Radio Netherlands (na): Newsline. See S 0037.
0037 Radio Netherlands: Newsline. See S 0037.
0052 Radio Netherlands (na): Media Network. Jonathan Marks surveys communications and media developments. Top-rated.
0052 Radio Netherlands: Media Network. See H 0152.

Saturdays

0000 Radio Canada Int'l: As It Happens. See M 2330.
0025 Radio Netherlands (na): Press Review. See T 0025.
0037 Radio Netherlands (na): Newsline. See S 0037.
0037 Radio Netherlands: Newsline. See S 0037.
0052 Radio Netherlands (na): Towards 2000. A focus on the global aspects of social change.
0052 Radio Netherlands: Towards 2000. See F 1152.



QSL from Syrian Arab Republic Broadcasting Service comes to us courtesy of Donald Michael Choleva of Euclid, Ohio.

FREQUENCIES

0100-0200	Australia, Radio	9580pa	9610as	9660pa	11715as
		11855as	13605as	13755as	15240pa
		15365pa	15415as	15510as	17715as
		17750as	17795pa	17860pa	17880as
0100-0200 vl	Australia, VL8A Alice Spg	4835do			
0100-0200 vl	Australia, VL8K Katherine	5025do			
0100-0200 vl	Australia, VL8T Tent Crk	4910do			
0100-0200 vl	Canada, CBC N Quebec Sce	9625do			
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CHNX Halifax	6130do			
0100-0200	Canada, CKZN St John's	6160do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0130	Costa Rica, AWR Alajuela	5030ca	6150sa	9725ca	
0100-0200	Costa Rica, R Peace Intl	7385am	9400am	12150am	15030am
0100-0200	Cuba, Radio Havana Cuba	6000na	9830na		
0100-0127	Czech Rep, Radio Prague	7345na			
0100-0200	Ecuador, HCJB Quito	9745am	12005am	17490eu	21455eu
0100-0150	Germany, Deutsche Welle	6040na	6085na	6120na	6145na
		9565na	9670na	9700na	
0100-0200 m	Guatemala, Radio Cultural	3300do			
0100-0200	Indonesia, Voice of	9675as	11752as		
0100-0130	Iran, VOIRI Tehran	7100na	9022na	11790na	
0100-0200 vl	Italy, IRRS Milan	7125eu			
0100-0110	Italy, RAI Rome	9645na	11800na		
0100-0200	Japan, NHK/Radio	9565na	11840as	11860as	11910as
		15195as	17810as	17845as	
0100-0130	Laos, Lao National Radio	7116as			
0100-0200 smtwh	Malaysia, Radio	7295do			
0100-0200	Netherlands, Radio	5905as	7305as		
0100-0125	Netherlands, Radio	6020na	6165na	9840na	11655na
0100-0200	New Zealand, R NZ Intl	15115pa			
0100-0200 vl	Papua New Guinea, NBC	9675do			
0100-0130	Philippines, FEBC/R Intl	15450as			
0100-0200	Russia, Voice of	5940na	6005as	6120na	7105na
		7165na	7180na	7315as	9400me
		9920me	15425na	17570as	17890as
0100-0200 vl	Slovakia, AWR	7270as			
0100-0130	Slovakia, R Slovakia Intl	5930na	7300na	9440na	
0100-0200	South Korea, R Korea Intl	7550eu	15575na		
0100-0200	Spain, R Exterior Espana	9540na			
0100-0200	Sri Lanka, SLBC Colombo	15425as			
0100-0130	Switzerland, Swiss R Intl	5885na	6135na	9885na	9905na
0100-0200	Ukraine, R Ukraine Intl	7405na	9620eu	9810na	11870na
0100-0200	United Kingdom,BBC London	5965as	5975na	6175na	7160as
		7325na	9580as	9590na	9915sa
		11750sa	11955me	15260sa	15310as
		15360as	17790as		
0100-0200	USA, KAIJ Dallas TX	13740na			
0100-0200	USA, KTBN Salt Lk City UT	7510na			
0100-0200	USA, KVOH Los Angeles CA	7415am			
0100-0200	USA, KWHR Naalehu HI	17510as			
0100-0200	USA, Monitor Radio Intl	7535na	9430am		
0100-0200	USA, VOA Washington DC	5995am	6130am	7405am	9455am
		9775am	11580am	15120am	15205am
		15340as	17740as		
0100-0200	USA, WCSN Scotts Cor ME	7465eu			
0100-0200	USA, WEWN Birmingham AL	5825eu	7425na	9985sa	
0100-0200	USA, WHRI Noblesville IN	7315am			
0100-0200	USA, WINB Red Lion PA	11950na			
0100-0200	USA, WJCR Upton KY	7490na	13595na		
0100-0130 twhfas	USA, WRMI/R Miami Intl	9955am			
0100-0200 m	USA, WRMI/R Miami Intl	9955am			
0100-0200	USA, WRNO New Orleans LA	7355am			
0100-0200	USA, WWCR Nashville TN	5065am	5935am	7435am	
0100-0200	USA, WYFR Okeechobee FL	6065na	9505na		
0100-0130	Uzbekistan, R Tashkent	7190eu	7250eu	9715eu	9740eu
0130-0145	Albania, R Tirana Intl	9580na	11840na		
0130-0200	Austria, R Austria Intl	9655na	9870sa	13730sa	
0130-0150	Greece, Voice of	7450na	9420na	9935na	
0130-0200	Netherlands, Radio	9860as	11655as		
0130-0200	Sweden, Radio	9895au	11695as		
0140-0200	Vatican State, Vatican R	5980as	7335as		

SELECTED PROGRAMS

Sundays

0108 Deutsche Welle: Inside Europe. A radio magazine offering a European perspective on events of the week.
0110 Radio Japan: This Week. A weekly variety show.
0125 Radio Netherlands: Program Info. Summary of upcoming program schedules.
0137 Deutsche Welle: Religion and Society. News and developments concerning the world's major religions.
0137 Radio Netherlands: Happy Station. Jonathan Groubert hosts this 65 year old program of family entertainment.
0147 Radio Japan: Music Gallery. Spotlight on a Japanese entertainer or musical group.
0155 Radio Japan: Tokyo Pop-In. A sample of the Japanese music scene.

Mondays

0108 Deutsche Welle: Mailbag. Listener mail from the Americas is answered.
0110 Radio Japan: Let's Learn Japanese. See S 0315.
0118 Deutsche Welle: Living in Germany. A weekly look at the social and political issues in the 1990s.
0125 Radio Japan: Media Roundup. See S 0525.
0125 Radio Netherlands: Music Break. See S 0225.
0133 Deutsche Welle: German by Radio. See S 1134.
0135 Radio Netherlands: They're Playing My Song. See S 0235.
0150 Radio Japan: Viewpoint. See S 0350.
0153 Radio Netherlands: EuroQuest. See S 0253.
0155 Radio Japan: Tokyo Pop-In. See S 0155.

Tuesdays

0109 Deutsche Welle: European Journal. See M 0224.
0115 Radio Japan: Current Views. See M 0515.
0120 Radio Japan: Spectrum. See M 0520.
0125 Radio Netherlands: Program Info. See S 0125.
0133 Deutsche Welle: German Tribune. News and views from the Federal Republic.
0138 Radio Netherlands: Newsline. See S 0037.
0152 Radio Netherlands: Accent on Asia. A magazine program focusing on Asia with interviews and music.
0155 Radio Japan: Tokyo Pop-In. See S 0155.

Wednesdays

0109 Deutsche Welle: European Journal. See M 0224.
0115 Radio Japan: Current Views. See M 0515.
0120 Radio Japan: Enjoy Japanese. See T 0520.
0125 Radio Netherlands: Program Info. See S 0125.
0133 Deutsche Welle: Backdrop. A program of culture and the arts in Germany.
0138 Radio Netherlands: Newsline. See S 0037.
0153 Radio Netherlands: Sounds Interesting. See S 0052.
0155 Radio Japan: Tokyo Pop-In. See S 0155.

Thursdays

0109 Deutsche Welle: European Journal. See M 0224.
0115 Radio Japan: Current Views. See M 0515.
0120 Radio Japan: Spectrum. See M 0520.
0125 Radio Netherlands: Program Info. See S 0125.
0133 Deutsche Welle: German Tribune. See T 0133.
0138 Radio Netherlands: Newsline. See S 0037.
0152 Radio Netherlands: Media Network. Jonathan Marks surveys communications and media developments. Top-rated.
0155 Radio Japan: Tokyo Pop-In. See S 0155.

Fridays

0109 Deutsche Welle: European Journal. See M 0224.
0115 Radio Japan: Current Views. See M 0515.
0120 Radio Japan: Enjoy Japanese. See T 0520.
0125 Radio Netherlands: Program Info. See S 0125.
0133 Deutsche Welle: Come to Germany. Focus on a seasonal event, festival, or attraction.
0138 Radio Netherlands: Newsline. See S 0037.
0152 Radio Netherlands: Research File. See M 1152.
0155 Radio Japan: Tokyo Pop-In. See S 0155.

Saturdays

0108 Deutsche Welle: European Journal. See M 0224.
0110 Radio Japan: Today's Top News Asia. See M 1410.
0115 Radio Japan: Current Views. See M 0515.
0120 Radio Japan: The Travel and Book Beat. See F 1420.
0121 Radio Japan: Japan Travelogue. See F 0521.
0125 Radio Netherlands: EuroPress Review. Five-minutes of EuroPress news.
0131 Deutsche Welle: Through German Eyes. See S 1518.
0135 Radio Japan: Short Story. See F 0535.
0135 Radio Netherlands: They're Playing My Song. See S 0235.
0145 Radio Japan: Book Review. See F 0545.
0154 Radio Netherlands: Documentary. See W 1154.
0155 Radio Japan: Tokyo Pop-In. See S 0155.

0200 UTC SHORTWAVE GUIDE 9:00 PM EST 6:00 PM PST

FREQUENCIES

0200-0300 twhfa	Argentina, RAE	11710am			
0200-0300	Australia, Radio	9580pa	9660pa	13605as	15240pa
		15365pa	15415as	15510as	17750as
		17795pa	17860pa	17880as	
0200-0300 vl	Australia, VL8A Alice Spg	4835do			
0200-0300 vl	Australia, VL8K Katherine	5025do			
0200-0300 vl	Australia, VL8T Tent Crk	4910do			
0200-0300 vl	Canada, CBC N Quebec Sce	9625do			
0200-0300	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZN St John's	6160do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0300	Canada, RCI Montreal	6120na	9535na	9755na	11845na
0200-0300	Costa Rica, R Peace Intl	7385am	9400am	15030am	
0200-0300	Cuba, Radio Havana Cuba	6000na	9830na		
0200-0300	Ecuador, HCJB Quito	9745am	12005am	17490eu	21455eu
0200-0300	Egypt, Radio Cairo	9475na			
0200-0250	Germany, Deutsche Welle	6035as	6130as	7265as	9515as
		9615as	9690as	9815as	12045as
0200-0230	Hungary, Radio Budapest	6025na	9835na	11910na	
0200-0300 vl	Italy, IRRS Milan	7125eu			
0200-0300	Kenya, Kenya Broadc Corp	4935do			
0200-0300 smtwh	Malaysia, Radio	7295do			
0200-0225	Moldova, R Moldova Intl	7190na			
0200-0230	Myanmar, Radio	5990do			
0200-0230	Netherlands, Radio	5905as	7305as	9860as	11655as
0200-0300	New Zealand, R NZ Intl	15115pa			
0200-0230 m	Norway, Radio Norway Intl	9560na			
0200-0300 vl	Papua New Guinea, NBC	9675do			
0200-0300	Romania, R Romania Intl	6155na	9510na	9570na	11830na
		11940na			
0200-0300	Russia, Voice of	5915na	5940na	5950na	6120as
		7105na	7165eu	7180eu	7205eu
		7315eu	9850as	17570as	17890as
0200-0228	Serbia, Radio Yugoslavia	6190na			
0200-0300 vl	Slovakia, AWR	7270as			
0200-0230	Sri Lanka, SLBC Colombo	15425as			
0200-0300	Taiwan, VO Free China	5950na	9680na	9765pa	11740ca
		11860as	15345as		
0200-0300	United Kingdom,BBC London	5975na	6175na	6195me	7155me
		7235me	7325na	9410eu	9590na
		9630af	9915am	11750sa	11955me
		15360as	17790as		
0200-0300	USA, KAIJ Dallas TX	5810am			
0200-0300	USA, KTBN Salt Lk City UT	7510am			
0200-0230	USA, KVOH Los Angeles CA	17775am			
0200-0300	USA, KWHR Naalehu HI	17510as			
0200-0300	USA, Monitor Radio Intl	5850na	9430am		
0200-0300	USA, VOA Washington DC	6130sa	7115as	7205as	7215as
		9455sa	9740as	11705as	15250as
		15370as	17740as	21550as	
0200-0230 twhfa	USA, VOA Washington DC	5995am	7405am	9775am	11580am
		15120am	15205am		
0200-0300	USA, WCSN Scotts Cor ME	7465am			
0200-0300	USA, WEWN Birmingham AL	5825eu	7425na	9410me	
0200-0300	USA, WHRI Noblesville IN	7315am			
0200-0300	USA, WINB Red Lion PA	11950na			
0200-0300	USA, WJCR Upton KY	7490na	13595na		
0200-0300 m	USA, WRMI/R Miami Intl	9955am			
0200-0300	USA, WRNO New Orleans LA	7355am			
0200-0300	USA, WWCR Nashville TN	5065am	5935am	7435am	
0200-0300	USA, WYFR Okeechobee FL	6065na	9505na		
0230-0300	Albania, R Tirana Intl	9580na	11840na		
0230-0245	Pakistan, Radio	7290as	15190as	17705as	17725as
		21730as			
0230-0300 twhfa	Portugal, Radio	9570na	9705na	11840sa	
0230-0300	Russia, Voice of	12050na	15455ca		
0230-0300	Sweden, Radio	6195na	6200na	9850na	
0250-0300	Vatican State, Vatican R	6095na	7305na		

SELECTED PROGRAMS

Sundays
0208 Deutsche Welle: Commentary. Guest commentary about a current event.
0212 Deutsche Welle: Sports Report. The latest news from the world of sports.
0216 Deutsche Welle: Asia-Pacific Mailbag. Listener mail from Asia-Pacific region is answered.
0225 Radio Netherlands: Music Break. Five-minutes of music at the end of an hour's program.
0235 Radio Netherlands: They're Playing My Song. Reminiscencing about songs which had meaning to RN's producers.
0253 Radio Netherlands: EuroQuest. An audio magazine with correspondents from European locations.

Mondays
0204 Radio Canada Int'l: Quirks and Quarks. The latest trends in science and technology.
0209 Deutsche Welle: Asia-Pacific Report. Correspondent reports, interviews and background news from the Asia-Pacific region.
0224 Deutsche Welle: European Journal. A review of major events in Europe and Germany through interviews, analyses and background reports.
0225 Radio Netherlands: Music Break. See S 0225.
0236 Radio Netherlands: Happy Station. See S 0137.

Tuesdays
0209 Deutsche Welle: Asia-Pacific Report. See M 0209.
0211 Radio Canada Int'l: Spectrum. See M 1440.
0224 Deutsche Welle: European Journal. See M 0224.
0225 Radio Netherlands: Music Break. See S 0225.
0238 Radio Netherlands: Newsline. See S 0037.
0252 Radio Netherlands: Research File. See M 1152.

Wednesdays
0209 Deutsche Welle: Asia-Pacific Report. See M 0209.
0211 Radio Canada Int'l: Spectrum. See M 1440.
0224 Deutsche Welle: European Journal. See M 0224.
0225 Radio Netherlands: Music Break. See S 0225.
0238 Radio Netherlands: Newsline. See S 0037.
0253 Radio Netherlands: Mirror Images. See T 1152.

Thursdays
0209 Deutsche Welle: Asia-Pacific Report. See M 0209.
0211 Radio Canada Int'l: Spectrum. See M 1440.
0224 Deutsche Welle: European Journal. See M 0224.
0225 Radio Netherlands: Music Break. See S 0225.
0238 Radio Netherlands: Newsline. See S 0037.
0254 Radio Netherlands: Documentary. See W 1154.

Fridays
0209 Deutsche Welle: Asia-Pacific Report. See M 0209.
0211 Radio Canada Int'l: Spectrum. See M 1440.
0224 Deutsche Welle: European Journal. See M 0224.
0225 Radio Netherlands: Music Break. See S 0225.
0238 Radio Netherlands: Newsline. See S 0037.
0252 Radio Netherlands: Media Network. See H 0152.

Saturdays
0208 Deutsche Welle: Commentary. See S 0208.
0211 Radio Canada Int'l: Spectrum. See M 1440.
0212 Deutsche Welle: The Week in Germany. A summary of the week's events in Germany by Deutsche Welle's Bonn correspondents.
0222 Deutsche Welle: Economic Notebook. See T 0333.
0225 Radio Netherlands: Music Break. See S 0225.
0237 Deutsche Welle: The Jazz Corner. A musical change-of-pace from the world of jazz.
0238 Radio Netherlands: Newsline. See S 0037.
0252 Radio Netherlands: Bats; Balls & Baselines. Sports results, news, issues, features, personality profiles, and investigations.

THANK YOU . . .

ADDITIONAL CONTRIBUTORS TO THIS MONTH'S SHORTWAVE GUIDE:

John Babbis, Silver Springs, MD; Gerald R. Brookman, Kenai, AK; Bob Fraser, Cohasset, MA; Jim Moats, Ravenna, OH; Pete Nelson, Lansing, MI; David Norcross, Barrigada, Guam; Bill Scarbrough, Knoxville, TN; Giovanni Serra, Rome, Italy; Nick Terrence, Huntington, NY; Robert Thomas, Bridgeport, CT; Robert Tucker, Savannah, GA; Sam Wright, Biloxi, MS; NASWA *Journal*; ODXA/*DX Ontario*; Speedx; *Fine Tuning*; World DX Club; Radio Netherlands *Media Network*; *BBC Worldwide*; BBC *Summary of World Broadcasts*; Grove Enterprises BBS; Internet Shortwave Newsgroup via Larry Van Horn.

FREQUENCIES

0300-0400	Australia, Radio	9580pa	9660pa	13605pa	15240pa
		15365pa	15415as	15510as	17795pa
		17860pa			
0300-0400 vl	Australia, VL8A Alice Spg	4835do			
0300-0400 vl	Australia, VL8K Katherine	5025do			
0300-0400 vl	Australia, VL8T Tent Crk	4910do			
0300-0400	Bahrain, Radio	6010do			
0300-0400 vl	Canada, CBC N Quebec Sce	9625do			
0300-0400	Canada, CFCX Montreal	6005do			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFVP Calgary	6030do			
0300-0400	Canada, CHNX Halifax	6130do			
0300-0400	Canada, CKZN St John's	6160do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400	Canada, RCI Montreal	6000am	9725am	9755am	
0300-0400	China, China Radio Intl	9690na	9710na	11715na	
0300-0400	Costa Rica, R Peace Intl	7385am	9400am	15030am	
0300-0400 vl	Costa Rica,Faro del Carib	5055do			
0300-0400	Cuba, Radio Havana Cuba	6000na	9830na		
0300-0327	Czech Rep, Radio Prague	5930na	7345na		
0300-0400	Ecuador, HCJB Quito	9745am	12005am	17490eu	21455eu
0300-0330	Egypt, Radio Cairo	9475na			
0300-0350	Germany, Deutsche Welle	6045na	6085na	6120na	9535na
		9640na	9650na		
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400 vl	Italy, IRRS Milan	7125eu			
0300-0400	Japan, NHK/Radio	5960na	9565na	15210as	15230na
		17810as	17845as		
0300-0400	Kenya, Kenya Broadc Corp	4935do			
0300-0400 s	Lebanon, Wings of Hope	9960me			
0300-0400 smtwh	Malaysia, Radio	7295do			
0300-0330	Mongolia, R Ulan Bator	7295na	12015na		
0300-0325	Netherlands, Radio	9860as	11655as		
0300-0400	New Zealand, R NZ Intl	15115pa			
0300-0400 vl	Papua New Guinea, NBC	9675do			
0300-0400	Russia, Voice of	4740eu	4940eu	5940na	5950eu
		6035eu	6085eu	7105na	7165na
		7180na	7270na	9670as	9850as
		9880as			
0300-0400	S Africa, Channel Africa	5955af	9585af		
0300-0400 vl	Slovakia, AWR	6050af	7270as		
0300-0400	Taiwan, VO Free China	5950na	9680na	9765pa	11745as
		15345as			
0300-0400	Thailand, Radio	11890na			
0300-0330	United Kingdom,BBC London	6175na	7235me	7325na	9915sa
		15360as			
0300-0400	United Kingdom,BBC London	3255af	5975na	6005af	6175eu
		6180eu	6190af	6195eu	7230eu
		7325eu	9410eu	9600af	11730af
		11760me	11955as	15280as	15310me
		21715as			
0300-0400	USA, KAIJ Dallas TX	5810am	9815am		
0300-0400	USA, KTBN Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9785am			
0300-0400	USA, KWHR Naalehu HI	17510as			
0300-0400	USA, Monitor Radio Intl	5850na	9455af		
0300-0400	USA, VOA Washington DC	6035af	7105af	7280af	7340af
		7405af	9575af	9885af	
0300-0400	USA, WCSN Scotts Cor ME	7465am			
0300-0400	USA, WEWN Birmingham AL	7425na			
0300-0400	USA, WHRI Noblesville IN	7315am	9495am		
0300-0400	USA, WINB Red Lion PA	11950eu			
0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400	USA, WRNO New Orleans LA	7355am			
0300-0400	USA, WWCR Nashville TN	5065am	5935am	7435am	
0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300-0315	Vatican State, Vatican R	6095na	7305na		
0315-0330 sh	Greece, Voice of	7450na	9420na	9935na	
0320-0350	Vatican State, Vatican R	5865af	7360af	9725af	
0330-0400	Austria, R Austria Intl	9870sa	13790sa		
0330-0357	Czech Rep, Radio Prague	5930as	7345af	9440me	
0330-0400	Hungary, Radio Budapest	5965na	9835na	11910na	
0330-0400 mfas	Mongolia, R Ulan Bator	7295na	12000na		
0330-0400	Netherlands, Radio	6015na	6165na		
0330-0400	Russia, Voice of	5905eu	7345na		
0330-0400	Sweden, Radio	6200na	9850na		
0330-0400	Tanzania, Radio	5050af			
0330-0357	UAE, Radio Dubai	11945na	13675na	15400eu	17890eu
		21485na			
0340-0350	Greece, Voice of	7450na	9420na	9935na	
0345-0400	Tajikistan, Radio	7245as			

SELECTED PROGRAMS

Sundays

0307 Radio Canada Int'l: Innovation Canada. Canadian entrepreneurs, inventors, and researchers and their ideas and discoveries.
0308 Deutsche Welle: Inside Europe. See S 0108.
0310 Radio Japan: Hello from Tokyo. See S 0310.
0310 Radio Japan: Hello from Tokyo. The weekend magazine program.
0315 Radio Japan: Let's Learn Japanese. A course in the Japanese language.
0330 Radio Canada Int'l: Earth Watch. Environment and ecology matters.
0337 Deutsche Welle: Religion and Society. See S 0137.
0337 Radio Netherlands (na): Newsline. See S 0037.
0350 Radio Japan: Viewpoint. Opinions of a guest personality.
0352 Radio Netherlands (na): Sounds Interesting. See S 0053.

Mondays

0308 Deutsche Welle: Mailbag. See M 0108.
0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
0315 Radio Japan: Radio Japan Magazine Hour. The weekday magazine program.
0318 Deutsche Welle: Living in Germany. See M 0118.
0330 Radio Canada Int'l: The Mailbag. See S 1437.
0333 Deutsche Welle: German by Radio. See S 1134.
0336 Radio Netherlands (na): Happy Station. See M 0036.
0350 Radio Japan: Close Up. Featuring a Japanese person of note.

Tuesdays

0309 Deutsche Welle: European Journal. See M 0224.
0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
0319 Radio Japan: News Commentary. See M 0515.
0319 Radio Japan: News Commentary. See M 0515.
0326 Radio Japan: Japan Diary. See M 1526.
0326 Radio Japan: Japan Diary. See M 1526.
0333 Deutsche Welle: Economic Notebook. The economic scene in Germany and around the world.
0338 Radio Netherlands (na): Newsline. See S 0037.
0350 Radio Japan: Close Up. See M 0350.
0352 Radio Netherlands (na): Research File. See T 0052.

Wednesdays

0309 Deutsche Welle: European Journal. See M 0224.
0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
0333 Deutsche Welle: Insight. See T 1533.
0338 Radio Netherlands (na): Newsline. See S 0037.
0350 Radio Japan: Close Up. See M 0350.
0353 Radio Netherlands (na): Mirror Images. See W 0052.

Thursdays

0309 Deutsche Welle: European Journal. See M 0224.
0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
0319 Radio Japan: News Commentary. See M 0515.
0319 Radio Japan: News Commentary. See M 0515.
0326 Radio Japan: Japan Diary. See M 1526.
0326 Radio Japan: Japan Diary. See M 1526.
0333 Deutsche Welle: German by Radio. See S 1134.
0338 Radio Netherlands (na): Newsline. See S 0037.
0350 Radio Japan: Close Up. See M 0350.
0354 Radio Netherlands (na): Documentary. See H 0054.

Fridays

0309 Deutsche Welle: European Journal. See M 0224.
0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
0319 Radio Japan: News Commentary. See M 0515.
0326 Radio Japan: Japan Diary. See M 1526.
0332 Deutsche Welle: Headcrash (2/3). News about computers for MS-DOS, Apple, and Amiga techies.
0338 Radio Netherlands (na): Newsline. See S 0037.
0350 Radio Japan: Close Up. See M 0350.
0352 Radio Netherlands (na): Media Network. See F 0052.

Saturdays

0308 Deutsche Welle: European Journal. See M 0224.
0310 Radio Japan: This Week. See S 0110.
0310 Radio Japan: This Week. See S 0110.
0330 Radio Japan: The Week in Review. Looking back at the events that made the news last week.
0331 Deutsche Welle: Through German Eyes. See S 1518.
0338 Radio Netherlands (na): Newsline. See S 0037.
0353 Radio Netherlands (na): Towards 2000. See A 0052.

HAUSER'S HIGHLIGHTS: JAPAN

Features

At about half past 03, 06, 07, 09, 11, 15, 19, and 23:
Mon, *Sports Spotlight*
Tue, *Japanese Culture Today*
Wed, *Asian Report*
Thu, *Crosscurrents*
Fri, *Business Focus*

At :20 past 05, 14, 17, 21 and 01:
Mon and Wed, *Spectrum*
Tue, *Enjoy Japanese* repeated Thu
Fri, *Travel and Book Beat*
Fax: 03-3481-1350
(via Diane Mauer)

0400 UTC SHORTWAVE GUIDE 11:00 PM EST 8:00 PM PST

FREQUENCIES

0400-0500	Australia, Radio	9580pa	9660pa	13605as	15240pa
		15365pa	15415pa	17750as	17795pa
		17860pa			
0400-0500 vl	Australia, VL8A Alice Spg	4835do			
0400-0500 vl	Australia, VL8K Katherine	5025do			
0400-0500 vl	Australia, VL8T Tent Crk	4910do			
0400-0500	Bahrain, Radio	6010do			
0400-0500 vl	Canada, CBC N Quebec Sce	9625do			
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZN St John's	6160do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0430	Canada, RCI Montreal	6150me	9505me	9670me	
0400-0500	China, China Radio Intl	9730na			
0400-0500	Costa Rica, R Peace Intl	7385am	9400am	15030am	
0400-0500	Cuba, Radio Havana Cuba	6000na	6060na	6180na	9830na
0400-0500	Cuba, Radio Havana Cuba	6000na	6060na	6180na	9830na
0400-0430	Ecuador, HCJB Quito	9745am	12005am	17490eu	21455eu
0400-0450	Germany, Deutsche Welle	6015af	6045na	6065af	7160af
		7225af	9565af	9765af	
0400-0500 twtfa	Guatemala, Radio Cultural	3300do			
0400-0500 vl	Italy, IRRS Milan	7125eu			
0400-0500	Kenya, Kenya Broadc Corp	4935do			
0400-0500 s	Lebanon, Wings of Hope	9960me			
0400-0500 smtwh	Malaysia, Radio	7295do			
0400-0425	Netherlands, Radio	6015na	6165na		
0400-0500	New Zealand, R NZ Intl	15115pa			
0400-0500 vl	Papua New Guinea, NBC	9675do			
0400-0430	Romania, R Romania Intl	6155na	9510na	9570na	11830na
		11940na			
0400-0500	Russia, Voice of	5905eu	5920na	5925eu	5935na
		5940na	5950na	5965eu	6035eu
		6085eu	7105na	7165eu	7180na
		7270na	7300na	7340na	9850as
0400-0500	S Africa, Channel Africa	5955af	9585af		
0400-0500 vl	Slovakia, AWR	6050as	9465af		
0400-0430	Sri Lanka, SLBC Colombo	9720as	15425as		
0400-0500	Swaziland, Swazi Radio	6155af			
0400-0430	Switzerland, Swiss R Intl	6135eu	9885na	9905na	
0400-0430	Tanzania, Radio	5050af			
0400-0500	Turkey, Voice of	9445na			
0400-0415	Uganda, Radio	4976do	5026do		
0400-0500	Ukraine, R Ukraine Intl	6055na	7180na	9810na	11870na
0400-0500	United Kingdom,BBC London	3255af	5975na	6005af	6180eu
		6190af	6195eu	7210af	9410af
		9600af	9640af	11760me	12095eu
		15280as	15310as	15575as	21715as
0400-0500	USA, KAIJ Dallas TX	5810am	9815am		
0400-0500	USA, KTBN Salt Lk City UT	7510am			
0400-0500	USA, KVOH Los Angeles CA	7415am			
0400-0500	USA, KWHR Naalehu HI	9930as			
0400-0500	USA, Monitor Radio Intl	7535eu	9840af		
0400-0500	USA, VOA Washington DC	5995eu	6040eu	6140af	6873af
		7170me	9885af		
0400-0500	USA, WEWN Birmingham AL	7425na			
0400-0500	USA, WHRI Noblesville IN	7315am	9495am		
0400-0500	USA, WINB Red Lion PA	11950eu			
0400-0500	USA, WJCR Upton KY	7490na	13595na		
0400-0500 smtwhf	USA, WMLK Bethel PA	9465eu			
0400-0500	USA, WRNO New Orleans LA	7395am			
0400-0500	USA, WWCR Nashville TN	5065am	5935am	7435am	
0400-0445	USA, WYFR Okeechobee FL	6065na	9505na		
0400-0459	USA, WYFR Okeechobee FL	9770eu			
0415-0440	Italy, RAI Rome	5990me	7275eu		
0425-0500	Nigeria, FRCN/Radio	3326do	4990do		
0430-0500	Ecuador, HCJB Quito	12005am	21455eu		
0430-0500	Russia, Voice of	4940as	4975as	6000as	9705as
		9775as	9785eu	9865eu	11675as
		11710as	11765as	12040eu	15160as
		15295as	15360as	17560as	17570au
		17580af	17610as	17620as	17675as
0430-0500	Swaziland, Trans World R	3200af	5055af	7140af	
0430-0500	Switzerland, Swiss R Intl	9905na			
0430-0500	USA, VOA Washington DC	6035af	7340af	7405af	9575af
0455-0500	Nigeria, FRCN/Voice of	7255af			

SELECTED PROGRAMS

Sundays

0407 Radio Canada Int'l: Innovation Canada. See S 0307.
0407 Voice of Turkey: Review of the Turkish Press. Items of current interest in the Turkish newspapers.
0409 Deutsche Welle: Commentary. See S 0208.
0410 Voice of Turkey: Outlook. An economy and finance update.
0412 Deutsche Welle: Sports Report. See S 0212.
0416 Deutsche Welle: International Talking Point. Journalists discuss major trends and events.
0418 Voice of Turkey: Cultural Transformations (biweekly). Views of Turkey's modernization.
0418 Voice of Turkey: VOT DX Corner (biweekly). Fifteen minutes of listening tips, DX/media news, and music.
0434 Voice of Turkey: Blue Voyage. The attractions of Turkey's coastal regions.
0436 Deutsche Welle: People and Places. Interviews, stories and music for Africa listeners.

Mondays

0407 Radio Canada Int'l: The Mailbag. See S 1437.
0407 Voice of Turkey: Review of the Turkish Press. See S 0407.
0408 Deutsche Welle: European Journal. See M 0224.
0415 Voice of Turkey: Noah's Ark. Archaeological exploration in Turkey.
0426 Voice of Turkey: Turkish Folksongs. Selections of Turkey's folk music.
0430 Voice of Turkey: Magnificent Istanbul. Zoom in on a point of interest in the ancient city.
0432 Deutsche Welle: Africa in the German Press. What the German newspapers and weeklies have to say about Africa.
0441 Voice of Turkey: Turkish Music. Selections of classical Turkish music.

Tuesdays

0407 Voice of Turkey: Review of the Turkish Press. See S 0407.
0408 Deutsche Welle: Africa Report. Reports and background to the news from Africa by Deutsche Welle correspondents.
0409 Voice of Turkey: Last Week. A recap of events affecting Turkey during the previous week.
0411 Radio Canada Int'l: Spectrum. See M 1440.
0419 Voice of Turkey: History of the Turkish Press. Background on media organizations in Turkey.
0424 Deutsche Welle: European Journal. See M 0224.
0426 Voice of Turkey: Turkish Hit Songs. Currently popular songs of Turkey.
0433 Voice of Turkey: Turkish Proverbs. Reflections of the Turkish culture.
0441 Voice of Turkey: Turkish Popular Music. Selections of music being played in Turkey.

Wednesdays

0405 Voice of Turkey: Review of the Turkish Press. See S 0407.
0408 Deutsche Welle: Africa Report. See T 0408.
0411 Radio Canada Int'l: Spectrum. See M 1440.
0412 Voice of Turkey: A Turkcologist and His Works. Spotlight on a Turkish scholor.
0419 Voice of Turkey: Popular Tukish Music. See M 0430.
0424 Deutsche Welle: European Journal. See M 0224.
0430 Voice of Turkey: Economic Panorama (biweekly). A brief look at the Turkish economy and tourism.
0430 Voice of Turkey: From Turkey (biweekly). Take a tour of the sights of Turkey.
0438 Voice of Turkey: Turkish Music. See M 0441.

Thursdays

0407 Voice of Turkey: Review of the Turkish Press. See S 0407.
0408 Deutsche Welle: Africa Report. See T 0408.
0410 Voice of Turkey: Review of the Foreign Media. Items of interest to Turkey found in the media of other countries.
0411 Radio Canada Int'l: Spectrum. See M 1440.
0414 Voice of Turkey: Letter Box. The weekly mailbag program.
0424 Deutsche Welle: European Journal. See M 0224.
0429 Voice of Turkey: In Your Own Voice. Interviews with visitors to Turkey.
0444 Voice of Turkey: Turkish Music. See M 0441.

Fridays

0405 Voice of Turkey: Review of the Turkish Press. See S 0407.
0408 Deutsche Welle: Africa Report. See T 0408.
0410 Voice of Turkey: From the World of Turkish Music. A Turkish musician and his music.
0411 Radio Canada Int'l: Spectrum. See M 1440.
0424 Deutsche Welle: European Journal. See M 0224.
0435 Voice of Turkey: International Organizations and Turkey. The relationships between Turkey, the UN, and similar activities.
0442 Voice of Turkey: Turkish Music. See M 0441.

Saturdays

0405 Voice of Turkey: Review of the Turkish Press. See S 0407.
0408 Deutsche Welle: Commentary. See S 0208.
0411 Radio Canada Int'l: Spectrum. See M 1440.
0411 Voice of Turkey: Turkish Album. Music and cultural interviews.
0412 Deutsche Welle: Africa This Week. A weekly review of trends and events on the African continent.
0430 Voice of Turkey: The Story of the Rebirth of Ankara. The history of this capital city.
0431 Deutsche Welle: Man and Environment. See T 1634.

FREQUENCIES

0500-0600	Australia, Radio	9580pa	9660pa	13605as	15240pa
		15365pa	15415as	17715pa	17750as
		17795as	17860pa	17880as	
0500-0600 vl	Australia, VL8A Alice Spg	4835do			
0500-0600 vl	Australia, VL8K Katherine	5025do			
0500-0600 vl	Australia, VL8T Tent Crk	4910do			
0500-0600	Bahrain, Radio	6010do			
0500-0600	Bulgaria, Radio	7335na	9700na		
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0600	Costa Rica, R Peace Intl	7385am	9400am	15030am	
0500-0600	Cuba, Radio Havana Cuba	6180na	9820na	9830na	
0500-0600	Ecuador, HCJB Quito	9745na	21455eu		
0500-0600 as	Eqt Guinea, R East Africa	9585af			
0500-0550	Germany, Deutsche Welle	5960na	6045na	6120na	6185na
0500-0515	Israel, Kol Israel	7465na	9435na	17545as	
0500-0600 vl	Italy, IRRS Milan	7125eu			
0500-0600	Japan, NHK/Radio	5975eu	6025na	7230eu	9565as
		11740as	11885na	15410as	17810as
0500-0600	Kenya, Kenya Broadc Corp	4935do			
0500-0600 s	Lebanon, Wings of Hope	9960me			
0500-0600	New Zealand, R NZ Intl	15115pa			
0500-0505	Nigeria, FRCN/Radio	3326do	4990do		
0500-0600	Nigeria, FRCN/Voice of	7255af			
0500-0530 m	Norway, Radio Norway Intl	5905na			
0500-0600 vl	Papua New Guinea, NBC	9675do			
0500-0600	Russia, Voice of	5905eu	5920eu	5925eu	5940eu
		5950as	6000eu	7105na	7165eu
		7175eu	7180eu	7270na	7340na
		7345na	9600na	9705na	9850na
		9865as	13370as	15295na	17735as
		17890as			
0500-0600	S Africa, Channel Africa	7185af	11900af		
0500-0553 f	Seychelles, FEBA Radio	17725me			
0500-0600 vl	Slovakia, AWR	9465af			
0500-0600	Spain, R Exterior Espana	9540na			
0500-0600	Swaziland, Swazi Radio	6155af			
0500-0530	Swaziland, Trans World R	5055af	6070af	7140af	7200af
0500-0502	Uganda, Radio	4976do			
0500-0600	United Kingdom,BBC London	3255af	5975na	6005af	6180eu
		6190af	6195eu	9410eu	9600af
		9640na	11760me	12095eu	15280as
		15310as	15360as	15400af	15420af
		15575as	17830as	17885af	
0500-0600	USA, KAIJ Dallas TX	5810am	9815am		
0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0600	USA, KVOH Los Angeles CA	7415am			
0500-0600	USA, KWHR Naalehu HI	9930as			
0500-0600	USA, Monitor Radio Intl	7535eu			
0500-0600	USA, VOA Washington DC	5995eu	6035af	6040eu	6140af
		6873af	7170me	7405af	9530eu
		9665af	9700eu	11825me	12080af
		15205me	15600af		
0500-0600	USA, WEWN Birmingham AL	7425am			
0500-0600	USA, WHRI Noblesville IN	7315am	9495am		
0500-0600	USA, WINB Red Lion PA	11950na			
0500-0600	USA, WJCR Upton KY	7490na	13595na		
0500-0600 mtwhfa	USA, WMLK Bethel PA	9465eu			
0500-0600	USA, WRNO New Orleans LA	7395am			
0500-0600	USA, WWCR Nashville TN	5065am	5935am	7435am	
0500-0600	USA, WYFR Okeechobee FL	5985na			
0500-0545	USA, WYFR Okeechobee FL	9850eu			
0500-0530	Vatican State, Vatican R	5865af	7360af	9725af	11625af
0510-0520	Botswana, Radio	3356af	4830af	7255af	
0525-0600	Ghana, Ghana Broadc Corp	3366do	4915do		
0530-0600	Australia, Radio	9660do	15510as	15565as	17715as
		17860pa	17880as		
0530-0600	Austria, R Austria Intl	6015na	6155eu	13730eu	15410me
		17870me			
0530-0600	Finland, YLE/Radio	6120eu	9635af	11755me	
0530-0600	Romania, R Romania Intl	11810af	15340af	15380af	17790af
0530-0600	Russia, Voice of	5930as	11710as		
0530-0600	Swaziland, Trans World R	9500af	9650af		
0530-0600	UAE, Radio Dubai	15435as	17830as	21700as	
0535-0600	Swaziland, Trans World R	6070af			
0542-0600 a	New Zealand, R NZ Intl	9700pa			
0550-0600 vl	Liberia, Radio ELBC	7275do			

SELECTED PROGRAMS

Sundays

0508 Deutsche Welle: Inside Europe. See S 0108.
0510 Radio Japan: Let's Learn Japanese. See S 0315.
0525 Radio Japan: Media Roundup. Reception reports, DX/media news, and equipment reviews.
0535 Radio Finland: Focus. A Review of Finland's top news stories.
0537 Deutsche Welle: Religion and Society. See S 0137.
0550 Radio Japan: Viewpoint. See S 0350.
0555 Radio Japan: Tokyo Pop-In. See S 0155.

Mondays

0508 Deutsche Welle: Mailbag. See M 0108.
0515 Radio Japan: Current Views. A Radio Japan editorial.
0518 Deutsche Welle: Living in Germany. See M 0118.
0520 Radio Japan: Spectrum. Focus on a topic of interest in Japan.
0530 Radio Finland: Compass North. See S 2330.
0533 Deutsche Welle: German by Radio. See S 1134.
0555 Radio Japan: Tokyo Pop-In. See S 0155.

Tuesdays

0509 Deutsche Welle: European Journal. See M 0224.
0515 Radio Japan: Current Views. See M 0515.
0520 Radio Japan: Enjoy Japanese. Learn and practice the Japanese language.
0530 Radio Finland: Compass North. See S 2330.
0533 Deutsche Welle: German Tribune. See T 0133.
0555 Radio Japan: Tokyo Pop-In. See S 0155.

Wednesdays

0509 Deutsche Welle: European Journal. See M 0224.
0515 Radio Japan: Current Views. See M 0515.
0520 Radio Japan: Spectrum. See M 0520.
0530 Radio Finland: Compass North. See S 2330.
0533 Deutsche Welle: Backdrop. See W 0133.
0555 Radio Japan: Tokyo Pop-In. See S 0155.

Thursdays

0509 Deutsche Welle: European Journal. See M 0224.
0515 Radio Japan: Current Views. See M 0515.
0520 Radio Japan: Enjoy Japanese. See T 0520.
0530 Radio Finland: Compass North. See S 2330.
0533 Deutsche Welle: German Tribune. See T 0133.
0555 Radio Japan: Tokyo Pop-In. See S 0155.

Fridays

0509 Deutsche Welle: European Journal. See M 0224.
0515 Radio Japan: Current Views. See M 0515.
0520 Radio Japan: The Travel and Book Beat.
0521 Radio Japan: Japan Travelogue. Looking at a place or event in Japan of interest to visitors.
0530 Radio Finland: Compass North. See S 2330.
0533 Deutsche Welle: Come to Germany. See F 0133.
0535 Radio Japan: Short Story. Narration of a short story by a Japanese author.
0545 Radio Japan: Book Review. Discussing a current book in print.
0555 Radio Japan: Tokyo Pop-In. See S 0155.

Saturdays

0509 Deutsche Welle: European Journal. See M 0224.
0510 Radio Japan: This Week. See S 0110.
0530 Radio Finland: Compass North. See S 2330.
0533 Deutsche Welle: Through German Eyes. See S 1518.
0547 Radio Japan: Music Gallery. See S 0147.

NEW DX PROGRAM

Worldscan will replace all DX programs currently on Adventist World Radio stations. It will be heard on most of the AWR shortwave stations, as well as on WRMI in Florida, and HRJA in Honduras.

Initially, *Worldscan* will be a 15-minute program written by Adrian Peterson and produced at regional locations. Plans are for it to grow to a 30-minute network broadcast. Finn Krone and Gordon Bennett will still be featured in the European edition.

A specially endorsed QSL card will be available for January, February, or March reports (Worldscan, Box 29235, Indianapolis, IN 46229, USA).

Worldscan tentative schedule

Target	Local Day	UTC	Unit	kHz
Asia	Sat	1515	KSDA3	9370
	Sun	1500	KSDA3	9370
	Sun	2315	KSDA2	11980
Eur	Sun	0900+	AWR-RS10	9450
	Sun	2100+	AWR-RS10	6055
NAm	Sat	0100+	WRMI	9955
CAm	Sat	2000+	HRJA	15675
LAm	Sun		TIAWR4	5030
		TIAWR5	6150	
		TIAWR1	7375	
		TIAWR2	9725	
		TIAWR3	13750	
		TGMU	5980	

(Direct from Adrian Peterson)

0600 UTC SHORTWAVE GUIDE

1:00 AM EST
10:00 PM PST

FREQUENCIES

0600-0700	Australia, Radio	9660do	11910pa	13755pa	15510as
		17715as	17880as		
0600-0630	Australia, Radio	13605as	15240pa	15415pa	17795as
0600-0700 vl	Australia, VL8A Alice Spg	4835do			
0600-0700 vl	Australia, VL8K Katherine	5025do			
0600-0700 vl	Australia, VL8T Tent Crk	4910do			
0600-0700	Bahrain, Radio	6010do			
0600-0700	Canada, CFCX Montreal	6005do			
0600-0700	Canada, CFRX Toronto	6070do			
0600-0700	Canada, CFVP Calgary	6030do			
0600-0700	Canada, CHNX Halifax	6130do			
0600-0700	Canada, CKZU Vancouver	6160do			
0600-0630 mtwtf	Canada, RCI-PK	6050eu	6150eu	9760eu	119050me
0600-0700	Costa Rica, R Peace Intl	7385am	9400am	15030am	
0600-0700	Cuba, Radio Havana Cuba	9820na			
0600-0700	Ecuador, HCJB Quito	9745na	21455eu		
0600-0700 as	Eqt Guinea, R East Africa	9585af			
0600-0650	Germany, Deutsche Welle	6100af	9565af	11765af	13790af
		15185af	17820af	21705af	
0600-0615	Ghana, Ghana Broadc Corp	3316do	4915do		
0600-0700 vl	Italy, IRRS Milan	7125eu			
0600-0700	Japan, NHK/Radio	11860as	21610as		
0600-0700	Kenya, Kenya Broadc Corp	4935do			
0600-0700 vl	Kiribati, Radio	9825do			
0600-0630	Laos, Lao National Radio	7116as			
0600-0700 s	Lebanon, Wings of Hope	9960me			
0600-0700	Liberia, Radio ELWA	4760do			
0600-0700 asmtwh	Malaysia, Radio	7295do			
0600-0700	Malaysia, Voice of	6175as	9750as	15295as	
0600-0700	Malta, V of Mediterranean	9765me			
0600-0700	New Zealand, R NZ Intl	15115pa			
0600-0700 as	New Zealand, R NZ Intl	9700pa			
0600-0630	Nigeria, FRCN/Radio	3326do	4990do		
0600-0700	Nigeria, FRCN/Voice of	7255af			
0600-0700 vl	Papua New Guinea, NBC	9675do			
0600-0700	Russia, Voice of	5905eu	5930eu	7175na	7270na
		7345na	9850as	11710na	13370as
		15230as	17570na	17620as	17735af
		17840as	17890as	21790as	
0600-0700 vl	Slovakia, AWR	13715af			
0600-0630 vl	Solomon Islands, SIBC	5020do	9545do		
0600-0700	South Korea, R Korea Intl	11945na			
0600-0700	Swaziland, Swazi Radio	6155af			
0600-0700	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0600-0615	Switzerland, Swiss R Intl	3985eu	6165eu		
0600-0630	Switzerland, Swiss R Intl	9885af	13635af	15340af	
0600-0615 s	Uganda, Radio	4976do	7110do		
0600-0700	United Kingdom,BBC London	6005af	6180eu	6195af	9410eu
		9600af	9640na	11760me	11940af
		11955as	12095eu	15280as	15310as
		15360as	15400af	15575eu	17790as
		17830as	17885af		
0600-0700	USA, KAIJ Dallas TX	5810am	9815am		
0600-0700	USA, KTBN Salt Lk City UT	7510na			
0600-0700	USA, KVOH Los Angeles CA	7415am			
0600-0700	USA, KWHR Naalehu HI	9930as			
0600-0700	USA, Monitor Radio Intl	7535eu			
0600-0700	USA, VOA Washington DC	3980eu	5995eu	6040eu	6060eu
		6140af	6873eu	7170me	7325me
		7405af	9530af	9665af	11805af
		11825af	11950af	12035af	12080af
		15205me	15600af		
0600-0700	USA, WHRI Noblesville IN	7315am	9495am		
0600-0700	USA, WINB Red Lion PA	11950na			
0600-0700	USA, WJCR Upton KY	7490na	13595na		
0600-0700 smtwhf	USA, WMLK Bethel PA	9465eu			
0600-0700	USA, WWCR Nashville TN	5065am	5935am	7435am	
0600-0700	USA, WYFR Okeechobee FL	5985na	7355eu	9680eu	9850af
0600-0620	Vatican State, Vatican R	3945eu	6245eu		
0600-0700	Yemen, Yemeni Rep Radio	9780do			
0630-0700	Australia, Radio	9580pa	9860pa	11880pa	15415as
		21725as			
0630-0700	Austria, R Austria Intl	6015na			
0630-0700	Vatican State, Vatican R	5865af	7360af	9660af	11625af
0632-0641	Romania, R Romania Intl	7225eu	9550eu	9665eu	11810eu
0645-0700	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa
		17805pa			

SELECTED PROGRAMS

Sundays

0609 Deutsche Welle: Commentary. See S 0208.
0610 Radio Japan: Hello from Tokyo. See S 0310.
0612 Deutsche Welle: Sports Report. See S 0212.
0616 Deutsche Welle: International Talking Point. See S 0416.
0636 Deutsche Welle: People and Places. See S 0436.
0650 Radio Japan: Viewpoint. See S 0350.
0655 Radio Japan: Tokyo Pop-In. See S 0155.

Mondays

0609 Deutsche Welle: European Journal. See M 0224.
0615 Radio Canada Int'l: Report to the Peacekeepers. Information about Canada for Canadian Forces overseas.
0615 Radio Japan: Radio Japan Magazine Hour. See M 0315.
0634 Deutsche Welle: Africa in the German Press. See M 0432.
0650 Radio Japan: Close Up. See M 0350.
0655 Radio Japan: Tokyo Pop-In. See S 0155.

Tuesdays

0608 Deutsche Welle: Africa Report. See T 0408.
0615 Radio Canada Int'l: Report to the Peacekeepers. See M 0615.
0615 Radio Japan: Radio Japan Magazine Hour. See M 0315.
0624 Deutsche Welle: European Journal. See M 0224.
0650 Radio Japan: Close Up. See M 0350.
0655 Radio Japan: Tokyo Pop-In. See S 0155.

Wednesdays

0608 Deutsche Welle: Africa Report. See T 0408.
0615 Radio Canada Int'l: Report to the Peacekeepers. See M 0615.
0615 Radio Japan: Radio Japan Magazine Hour. See M 0315.
0624 Deutsche Welle: European Journal. See M 0224.
0650 Radio Japan: Close Up. See M 0350.
0655 Radio Japan: Tokyo Pop-In. See S 0155.

Thursdays

0608 Deutsche Welle: Africa Report. See T 0408.
0615 Radio Canada Int'l: Report to the Peacekeepers. See M 0615.
0615 Radio Japan: Radio Japan Magazine Hour. See M 0315.
0624 Deutsche Welle: European Journal. See M 0224.
0650 Radio Japan: Close Up. See M 0350.
0655 Radio Japan: Tokyo Pop-In. See S 0155.

Fridays

0608 Deutsche Welle: Africa Report. See T 0408.
0615 Radio Canada Int'l: Report to the Peacekeepers. See M 0615.
0615 Radio Japan: Radio Japan Magazine Hour. See M 0315.
0624 Deutsche Welle: European Journal. See M 0224.
0650 Radio Japan: Close Up. See M 0350.
0655 Radio Japan: Tokyo Pop-In. See S 0155.

Saturdays

0608 Deutsche Welle: Commentary. See S 0208.
0610 Radio Japan: This Week. See S 0110.
0612 Deutsche Welle: Africa This Week. See A 0412.
0622 Radio Japan: Japan Scene. A segment of the Magazine Hour about a current event in Japan.
0630 Radio Japan: The Week in Review. See A 0330.
0631 Deutsche Welle: Man and Environment. See T 1634.
0655 Radio Japan: Tokyo Pop-In. See S 0155.

Patrick Barry of Mission Viejo, California, provided us with this artistic QSL from RAI—Radiotelevisione Italiano.

FREQUENCIES

0700-0800	Australia, Radio	6080pa	9580pa	9860pa	11720pa
		11880pa	11910pa	13605pa	15240pa
		15565as	17695as	17750as	21595as
		21715as			
0700-0730	Australia, Radio	15415as	17795as		
0700-0800 vl	Australia, VL8A Alice Spg	4835do			
0700-0800 vl	Australia, VL8K Katherine	5025do			
0700-0800 vl	Australia, VL8T Tent Crk	4910do			
0700-0800	Bahrain, Radio	6010do			
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica, AWR Alajuela	6150am	9725am		
0700-0800	Costa Rica, R Peace Intl	7385am	9400am	15030am	
0700-0727	Czech Rep, Radio Prague	5930eu	7345eu	9505eu	
0700-0800	Ecuador, HCJB Quito	6135as	6205as	9420eu	9600eu
		9745pa	11835eu	11925pa	21455eu
0700-0800 as	Eqt Guinea, R East Africa	9585af			
0700-0730	Georgia, Radio	11805eu			
0700-0715	Ghana, Ghana Broadc Corp	3366do	4915do		
0700-0800 vl	Italy, IRRS Milan	7125eu			
0700-0800	Japan, NHK/Radio	5975eu	7230eu	11740as	15270as
		15335me	15410as	17810me	21610au
0700-0800	Kenya, Kenya Broadc Corp	4935do			
0700-0800 vl	Kiribati, Radio	9825do			
0700-0800	Liberia, Radio ELWA	4760do			
0700-0800 asmtwh	Malaysia, Radio	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0730	Myanmar, Radio	5990do	9730do		
0700-0715	New Zealand, R NZ Intl	15115pa			
0700-0800 as	New Zealand, R NZ Intl	9700pa			
0700-0800 vl	Papua New Guinea, NBC	4890do			
0700-0715	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa
		17805pa			
0700-0800	Russia, Voice of	5905eu	5930eu	7175na	7270na
		7345na	9480eu	9850as	11675eu
		13370as	15230me	15385me	17560na
		17795na	17840af	17890af	21790af
0700-0715	Sierra Leone, SLBS	3316do			
0700-0800 vl	Solomon Islands, SIBC	5020do	9545do		
0700-0800	Swaziland, Swazi Radio	6155af			
0700-0735	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0700-0730	Switzerland, Swiss R Intl	3985eu	6165eu		
0700-0800	Taiwan, VO Free China	5950na			
0700-0715 mtwtfa	Uganda, Radio	4976do	7110do		
0700-0800	United Kingdom,BBC London	6005eu	6180eu	6190af	6195eu
		7325eu	9410eu	9600af	9640na
		11760me	11940af	11955as	12095eu
		15070eu	15280af	15310as	15360as
		15400eu	15575eu	17790as	17830as
	17885af	21660af			
0700-0800	USA, KAIJ Dallas TX	5810am	9815na		
0700-0800	USA, KTBN Salt Lk City UT	7510na			
0700-0800	USA, KVOH Los Angeles CA	7415am			
0700-0800	USA, KWHR Naalehu HI	9930as			
0700-0800	USA, Monitor Radio Intl	7535eu			
0700-0800	USA, WEWN Birmingham AL	7425am	13615am		
0700-0800 vl	USA, WHRI Noblesville IN	7315am	9495am		
0700-0800	USA, WINB Red Lion PA	11950na			
0700-0800	USA, WJCR Upton KY	7490na	13595na		
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu			
0700-0800	USA, WWCR Nashville TN	5065am	5935am	7435am	
0700-0745	USA, WYFR Okeechobee FL	7355eu	9680eu	9850af	
0717-0800 mtwhf	New Zealand, R NZ Intl	9700pa			
0730-0800	Australia, Radio	9660pa	17880as		
0730-0800	Belgium, R Vlaanderen Int	5985eu	9925au		
0730-0757	Czech Rep, Radio Prague	17485as	21705au		
0730-0745 sh	Greece, Voice of	9425eu	11645eu	15650eu	
0730-0745 mtwhf	Iceland, Natl BC Service	9265am			
0730-0800	Netherlands, Radio	9720pa	11895pa		
0730-0745 mtwhf	Vatican State, Vatican R	3945eu	6245eu	7250eu	9645eu
		11740eu	15210eu	15570eu	
0735-0800 smtwhf	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0740-0800 mtwhf	Monaco, Trans World Radio	7120eu			
0745-0800	Finland, YLE/Radio	6120eu	9560eu	11755eu	
0745-0800 s	Ghana, Ghana Broadc Corp	3366do	4915do		

0800 UTC

0800-0900	Australia, Radio	5995pa	6020pa	6080pa	9580pa
		9710pa	9860pa	15565pa	17715as
		17880as			
0800-0830 vl	Australia, VL8A Alice Spg	4835do			
0800-0830 vl	Australia, VL8K Katherine	5025do			
0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0800-0900	Bahrain, Radio	6010do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0830	Ecuador, HCJB Quito	9600eu	9745pa	11835eu	11925pa
		21455eu			
0800-0900 as	Eqt Guinea, R East Africa	9585af			
0800-0805 s	Ghana, Ghana Broadc Corp	3366do			
0800-0900	Guam, KTWR Agana	15200as			
0800-0900	Indonesia, Voice of	9675as	11752as		
0800-0900 vl	Italy, IRRS Milan	7125eu			
0800-0900	Kenya, Kenya Broadc Corp	4935do			
0800-0900 vl	Kiribati, Radio	9825do			
0800-0830	Liberia, Radio ELWA	4760do			
0800-0900	Malaysia, Radio	7295do			
0800-0830	Malaysia, Voice of	6175as	9750as	15295as	
0800-0900 mtwtf	Monaco, Trans World Radio	7120eu			
0800-0825	Netherlands, Radio	9720pa	11895pa		
0800-0900 mtwhf	New Zealand, R NZ Intl	9700pa			
0800-0830 m	Norway, Radio Norway Intl	15175as			
0800-0850	Pakistan, Radio	15625eu	17900eu		
0800-0900 vl	Papua New Guinea, NBC	4890do			
0800-0900	Russia, Voice of	11675af	11710as	13370as	15230me
		17620na	17795as	17840as	17860as
		17890as			
0800-0815	Sierra Leone, SLBS	3316do			
0800-0900 vl	Slovakia, AWR	17630af			
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, R Korea Intl	7550eu	13670eu		
0800-0900	United Kingdom,BBC London	6195as	7325eu	9410eu	9640na
		11760as	11955as	12095eu	15070eu
		15280as	15360as	17640eu	17790af
		17830as	17885af	21660af	
0800-0900	USA, KAIJ Dallas TX	5810am	9815am		
0800-0900	USA, KNLS Anchor Point AK	7365as			
0800-0900	USA, KTBN Salt Lk City UT	7510am			
0800-0900	USA, KWHR Naalehu HI	9930as			
0800-0900	USA, Monitor Radio Intl	7535eu			
0800-0900	USA, WEWN Birmingham AL	7425sa	9350na		
0800-0900 vl	USA, WHRI Noblesville IN	7315am			
0800-0900	USA, WINB Red Lion PA	11950na			
0800-0900	USA, WJCR Upton KY	7490na	13595na		
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0800-0900	USA, WWCR Nashville TN	5065am	5935am		
0815-0900 mtwtf	Nigeria, FRCN/Radio	3326do	4990do		
0830-0900 vl	Australia, VL8A Alice Spg	2310do			
0830-0900 vl	Australia, VL8K Katherine	2485do			
0830-0900 vl	Australia, VL8T Tent Crk	2325do			
0830-0900	Austria, R Austria Intl	6155eu	13730eu	15450as	17870au
0830-0900	Ecuador, HCJB Quito	6135pa	9745pa	17490pa	
0830-0900	Netherlands, Radio	9720pa	9895pa	13700pa	
0830-0900	Slovakia, R Slovakia Intl	11990au	17485au	21705au	
0855-0900	Guam, KTWR Agana	11830pa			

HAUSER'S HIGHLIGHTS: WWCR

MUNDO RADIAL — Glenn Hauser's monthly Spanish DX report, has been Fri 2315 and Mon 2230 on 15685 around the 2nd and 3rd weeks of the month.

Spectrum repeat — Mon 0600 on 7435

Tempered Steel — Christian heavy metal, Rock the Universe

The Old Record Shop — Sun 0530 on 7435, Mon 2145 on 15685, Sat 0700 on 5065

President & the Republicans — Sat 1745 & 2345 on 15685

Extraordinary Science Radio Hour — Mon 0400 on 5065, 7435

The Big Backyard — Oz music, Mon 0630 on 5065, Sat 2200 on 12160

Yakov Spivak Show — New live talkshow from New York rabbi, airs Mon-Thu 2100-2200 on 12160 *(Just another anti-government show sponsored by coin purveyors (gh)*

Worldwide Country — moved to 1700-1900 on 12160 ex-17525, 1900-2100 tested 11970 since WINB has 12160 those two hours

(via Adam Lock, WWCR)

- *Kurt Saxon Show* ended Nov 25, as he was not satisfied with reception on 7435 at 0100-0200 (Lock)
- WWCR on 5935 and 5065 produce weak, distorted spurs on 4195, 4740 until 0804* (Brian Alexander, PA)
- Correction to Dec *MT* p. 44—WWCR rhombic legs are 375 feet, not 37!

A KEYNOTE SPEAKER *from Grove!*

NEW!

Why pay over $400 for these separate accessories:

- →Speaker
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- →Recorder Activator
- →Audio Amplifier
- →Audio Activated Squelch
- →Noise Limiter

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SOUND ENHANCER

The Grove engineering team has created the most revolutionary audio accessory on the communication market: the **SP200 Sound Enhancer.**

Housed in a stylish, solid oak cabinet hand crafted in the mountains of North Carolina, the **SP200** is sure to enhance any room and radio receiver. The control panel, constructed of sturdy, black aluminum, has been designed for optimum ease and convenience when tuning and refining signals.

The SP200 combines a powerful audio amplifier, top-of-the-line speaker, and an adjustable filter system in one to create the most versatile and precise listening environment ever available to radio enthusiasts. The keen peak/notch filter system and advanced noise limiter allow the listener to pull clear and distinct signals out of the haze of interference and background noise, while the adjustable bass and treble provide the flexibility to create just the sound you want. FSK, RTTY, packet, FAX, CW and all other data systems are enhanced while interference and electrical noise are reduced or even eliminated by the analog audio processor.

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Try the new Grove **SP200** Sound Enhancer with your receiver, scanner, or transceiver and enjoy the latest in speaker sophistication; you'll agree this is truly a keynote speaker!

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Power Required: 12 to 14 VDC @500 mA; 120 VAC adaptor incl.
Audio Power Output: 2.5 W @ 10% THD (8 ohms)
Audio Selectivity: Peak/notch 30 dB or greater, 0.3-6 kHz
Squelch Hold: 0-10 seconds
Noise Limiter: Adjustable-threshold pulse noise clamp
Tape Activator: Audio activated (VOX), 3 second hold
Tape Output: 500 mV P-P @ 600 ohms (nom.)
Headphone Jack: Universal mono-wired stereo jack
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Changing the way you hear the world

FREQUENCIES

0900-1000	Australia, Radio	9510as	9580pa	9860pa	13605as
		15170as	21725as		
0900-1000 vl	Australia, VL8A Alice Spg	2310do			
0900-1000 vl	Australia, VL8K Katherine	2485do			
0900-1000 vl	Australia, VL8T Tent Crk	2325do			
0900-1000	Bahrain, Radio	6010do			
0900-1000	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	11755pa	15440pa	17710pa	
0900-1000	Costa Rica, AWR Alajuela	5030am	6150am	9725am	
0900-1000	Costa Rica, R Peace Intl	7385am	9400am	15030am	
0900-1000	Ecuador, HCJB Quito	6135pa	9745pa	17490pa	21455pa
0900-1000 as	Eqt Guinea, R East Africa	9585af			
0900-1000	Finland, YLE/Radio	15330as	17800au		
0900-0950	Germany, Deutsche Welle	6160as	9565af	11715as	12055as
		15410af	17780as	17800af	21600af
		21650as	21680as		
0900-0915 mtwtf	Ghana, Ghana Broadc Corp	3366do	4915do		
0900-0915	Guam, KTWR Agana	15200as			
0900-1000	Guam, KTWR Agana	11830pa			
0900-1000 vl	Italy, IRRS Milan	7125eu			
0900-1000	Japan, NHK/Radio	9610as	9750as	11815as	15190as
		15270au			
0900-0948 vl	Kiribati, Radio	9825do			
0900-1000	Malaysia, Radio	7295do			
0900-0920 mtwtf	Monaco, Trans World Radio	7120eu			
0900-0930	Netherlands, Radio	9720pa	13700pa		
0900-1000 mtwhf	New Zealand, R NZ Intl	9700pa			
0900-1000 mtwtf	Nigeria, FRCN/Radio	3326do	4990do		
0900-1000	Nigeria, FRCN/Voice of	7255af			
0900-1000 mtwtfa	Palau, KHBN/Voice of Hope	9830as			
0900-1000 vl	Papua New Guinea, NBC	4890do			
0900-1000	Russia, Voice of	9480eu	9550eu	9800pa	11675as
		11710me	11975as	12015as	13370as
		15385eu	15580as	17670as	17765eu
		17795eu	17840na	17860as	
0900-1000 vl	Slovakia, AWR	9450eu	17630af		
0900-1000 vl	Solomon Islands, SIBC	5020do	9545do		
0900-0930	Switzerland, Swiss R Intl	9885au	13685au	17515au	
0900-1000	United Kingdom,BBC London	6190af	6195as	9410eu	9740as
		11750as	11760me	11940af	12095eu
		15070eu	15190sa	15310as	15575me
		17640eu	17705eu	17790af	17830as
		17885af	21660af	21715as	
0900-1000	USA, KAIJ Dallas TX	5810am	9815am		
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, KWHR Naalehu HI	9930as			
0900-1000	USA, Monitor Radio Intl	7395sa	7535eu		
0900-1000	USA, WEWN Birmingham AL	7465eu	9350na		
0900-1000 vl	USA, WHRI Noblesville IN	7315am	9495am		
0900-1000	USA, WINB Red Lion PA	11950na			
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwhf	USA, WMLK Bethel PA	9465eu			
0900-1000	USA, WWCR Nashville TN	5935am			
0910-0940	Mongolia, R Ulan Bator	7295na	12000na		
0915-1000	Ghana, Ghana Broadc Corp	6130do	7295do		
0920-0935 sh	Greece, Voice of	15650au	17525au		
0920-0935 a	Monaco, Trans World Radio	7120eu			
0920-0945 s	Monaco, Trans World Radio	7120eu			
0930-0945 s	Armenia, Radio Yerevan	15275eu	15370eu		
0930-1000	Canada, CKZN St John's	6160do			
0930-1000	Netherlands, Radio	7260pa	9720pa	9810pa	21505pa
0930-1000	Philippines, FEBC/R Intl	11690as			
0940-0950	Greece, Voice of	15650au	17525au		

1000-1100	Australia, Radio	9580pa	9860pa	15170as	21725as
1000-1100 vl	Australia, VL8A Alice Spg	2310do			
1000-1100 vl	Australia, VL8K Katherine	2485do			
1000-1100 vl	Australia, VL8T Tent Crk	2325do			
1000-1100	Bahrain, Radio	6010do			
1000-1030 mtwhfa	Belgium, R Vlaanderen Int	6035eu	15510af	17595af	
1000-1100	Bulgaria, Radio	12040au			
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZN St John's	6160do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	11755pa	15440pa	17710pa	
1000-1100	Costa Rica, AWR Alajuela	5030am	5970am	9725am	
1000-1100	Costa Rica, R Peace Intl	7385am	9400am	15030am	
1000-1100	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
1000-1100 as	Eqt Guinea, R East Africa	9585af			
1000-1040	Ghana, Ghana Broadc Corp	6130do	7295do		
1000-1100	India, All India Radio	15050as	15180as	17387au	17895as
1000-1100 vl	Italy, IRRS Milan	7125eu			
1000-1100	Malaysia, Radio	7295do			
1000-1100	Malaysia, RTM/Kota Kinaba	5980do			
1000-1030	Netherlands, Radio	7260pa	9720pa	9810pa	21505pa
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100	Nigeria, FRCN/Radio	4990do	7285do		
1000-1100	Nigeria, FRCN/Voice of	7255af			
1000-1100 mtwhfa	Palau, KHBN/Voice of Hope	9830as			
1000-1100 vl	Papua New Guinea, NBC	4890do	9675do		
1000-1100	Philippines, FEBC/R Intl	11690as			
1000-1100	Russia, Voice of	9480eu	9550eu	9800eu	11675na
		11710as	12015eu	15385na	17710af
		17860as			
1000-1100	S Africa, Channel Africa	17810af			
1000-1100 vl	Slovakia, AWR	9450eu			
1000-1015	Uganda, Radio	4976do			
1000-1100	United Kingdom,BBC London	6190af	6195as	7160as	9410eu
		9740as	11750as	11760me	11940af
		12095eu	15070eu	15190sa	15310as
		15400eu	15575me	17640eu	17705eu
		17790me	17830af	17885af	21470af
		21660af			
1000-1100	USA, KAIJ Dallas TX	5810am	9815am		
1000-1100	USA, KTBN Salt Lk City UT	7510am			
1000-1100	USA, KWHR Naalehu HI	9930as			
1000-1100	USA, Monitor Radio Intl	6095sa	7395sa		
1000-1100	USA, VOA Washington DC	5985pa	7405am	9590am	11720pa
		11915am	15120am	15425pa	
1000-1100	USA, WEWN Birmingham AL	7465eu			
1000-1100 vl	USA, WHRI Noblesville IN	6040am	9850am		
1000-1100	USA, WINB Red Lion PA	11950na			
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1100	USA, WWCR Nashville TN	5065am	15685am		
1000-1100	USA, WYFR Okeechobee FL	5950na			
1000-1030	Vietnam, Voice of	10059as	12025as	15010as	
1030-1100 mtwhfa	Austria, R Austria Intl	6155eu	13730eu	15450as	17870au
1030-1100 mtwhf	Ethiopia, Radio	5990af	7110af	9705af	
1030-1055	Iraq, Radio Iraq Intl	13680as			
1030-1100	Malaysia, RTM Kuching	7160do			
1030-1100	Netherlands, Radio	7260pa	9810pa		
1030-1100	UAE, Radio Dubai	13675eu	15320eu	15395eu	21605eu

HAUSER'S HIGHLIGHTS: NETHERLANDS

Launching the new year is a six-part series on *The Silver Screen*, commemorating the 100th anniversary of moving pictures—
Tue 0850, 1350, 1550, 1950, 2350,
Fri 0750, 0950, 1350, 1550, 1850, 2050,
Sat 0050, 0350, 1950, *i.a.*
(RN *On Target*, USENET via Thurman)

FREQUENCIES

1100-1200	Australia, Radio	9510pa	9580pa	9710pa	9860pa
		13605as	15170as	15565as	
1100-1200 vl	Australia, VL8A Alice Spg	2310do			
1100-1200 vl	Australia, VL8K Katherine	2485do			
1100-1200 vl	Australia, VL8T Tent Crk	2325do			
1100-1200	Bahrain, Radio	6010do			
1100-1200	Canada, CFCX Montreal	6005do			
1100-1200	Canada, CFRX Toronto	6070do			
1100-1200	Canada, CFVP Calgary	6030do			
1100-1200	Canada, CHNX Halifax	6130do			
1100-1200	Canada, CKZN St John's	6160do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200	Costa Rica, AWR Alajuela	5030am	5970am		
1100-1200	Costa Rica, R Peace Intl	7385am	9400am	15030am	
1100-1130	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
1100-1200	Ecuador, HCJB Quito	15115am	17890am	21455pa	
1100-1130	Georgia, Radio	11815eu			
1100-1150	Germany, Deutsche Welle	15370af	15410af	17765af	17800af
		21600af			
1100-1110 as	Ghana, Ghana Broadc Corp	3366do	4915do		
1100-1200 vl	Guatemala, AWR	5980ca			
1100-1130	Israel, Kol Israel	15640na	15650eu	17575eu	
1100-1200 vl	Italy, IRRS Milan	7125eu			
1100-1200	Japan, NHK/Radio	6120na	9610as	15295as	
1100-1200	Malaysia, Radio	7295do			
1100-1200	Malaysia, RTM Kuching	7160do			
1100-1200	Malaysia, RTM/Kota Kinaba	5980do			
1100-1200 mtwhf	New Zealand, R NZ Intl	9700pa			
1100-1105	Nigeria, FRCN/Radio	4990do	7285do		
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na	
1100-1120	Pakistan, Radio	15625as	17900as		
1100-1200 mtwhf	Palau, KHBN/Voice of Hope	9830as			
1100-1200 vl	Papua New Guinea, NBC	4890do	9675do		
1100-1200	Russia, Voice of	7205eu	9470eu	9550eu	9680eu
		9800eu	11675eu	11710as	11835as
		11980as	12015eu	13370as	15190as
		15265as	15495as	17755me	17765na
		17860me	21600af		
1100-1115	Rwanda, Radio	6055do			
1100-1200	S Africa, Channel Africa	9730af			
1100-1200	Singapore, SBC Radio One	6155do			
1100-1200	Singapore,R Singapore Int	9530as			
1100-1130	Switzerland, Swiss R Intl	6165eu	9535eu	9885as	11640as
		13635as			
1100-1102	Uganda, Radio	7110do	7195do		
1100-1200	United Kingdom,BBC London	5965na	5975na	6190af	6195na
		7160as	9410eu	9515na	9660eu
		9740as	11750as	11760me	11940af
		12095af	15070eu	15310as	15575as
		17640eu	17885af	21660af	
1100-1130	United Kingdom,BBC London	5965na	6110as	15400eu	17790sa
1100-1200	USA, KAIJ Dallas TX	5810am	9815am		
1100-1200	USA, KTBN Salt Lk City UT	7510na			
1100-1200	USA, KWHR Naalehu HI	9930as			
1100-1200	USA, Monitor Radio Intl	6095na	7395ca		
1100-1200	USA, VOA Washington DC	5985as	6110as	7405am	9590am
		9615as	9760as	11720as	11915am
		15120am	15160as	15425as	
1100-1200	USA, WEWN Birmingham AL	9350na	9370as		
1100-1200 vl	USA, WHRI Noblesville IN	6040am	9850am		
1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200	USA, WWCR Nashville TN	5065am	5935am	15685am	
1100-1200	USA, WYFR Okeechobee FL	5950na	7355na		
1120-1130 mtwtfa	Vatican State, Vatican R	6245eu	11740af	15210af	17585me
1130-1157	Czech Rep, Radio Prague	7345eu	9505eu	11990eu	
1130-1200	Netherlands, Radio	6045eu	7130eu		
1130-1200	South Korea, R Korea Intl	9650na			
1130-1200	Vietnam, Voice of	10059as	12025as	15010as	
1131-1152	Indonesia, RRI Sorong	4874do			
1145-1200	Rwanda, Radio	6055do			

SELECTED PROGRAMS

Sundays

1109 Deutsche Welle: Arts on the Air. Reports and interviews on major cultural events and developments.
1115 Radio Japan: Let's Learn Japanese. See S 0315.
1120 Radio Japan: Media Roundup. See S 0525.
1134 Deutsche Welle: German by Radio. An advanced German language course for English speakers.
1136 Radio Netherlands: Happy Station. See S 0137.
1150 Radio Japan: Viewpoint. See S 0350.

Mondays

1109 Deutsche Welle: Newsline Cologne. Worldwide current affairs program with a review of the German or European press.
1130 Radio Japan: Radio Japan Magazine Hour. See M 0315.
1134 Deutsche Welle: Hallo Africa. A program with musical requests and greetings to friends.
1137 Radio Netherlands: Newsline. See S 0037.
1140 Radio Japan: Crosscurrents. Radio Japan's mailbag program.
1152 Radio Netherlands: Research File. A program of science and technology.

Tuesdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1130 Radio Japan: Radio Japan Magazine Hour. See M 0315.
1132 Radio Japan: Japan Diary. See M 1526.
1134 Deutsche Welle: Hallo Africa. See M 1134.
1137 Radio Japan: Japanese Culture Today. Comparing modern-day Japan with the customs of old.
1137 Radio Netherlands: Newsline. See S 0037.
1145 Radio Japan: When Women Shine. Examples of the achievements of woment in modern Japan.
1152 Radio Netherlands: Mirror Images. Weekly magazine of music, the arts, culture, and European festivals.

Wednesdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1130 Radio Japan: Asian Report. Current events in the Asia-Pacific region.
1130 Radio Japan: Radio Japan Magazine Hour. See M 0315.
1134 Deutsche Welle: Hallo Africa. See M 1134.
1137 Radio Netherlands: Newsline. See S 0037.
1143 Radio Japan: Close Up. See M 0350.
1154 Radio Netherlands: Documentary. An in-depth treatment of one subject or a short series.

Thursdays

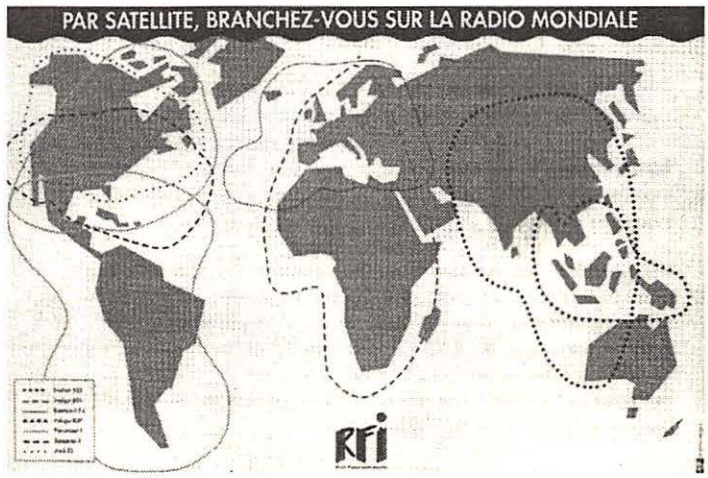
1109 Deutsche Welle: Newsline Cologne. See M 1109.
1124 Deutsche Welle: DXers World Meeting (4/5). A program for listeners in Africa.
1130 Radio Japan: Japan Diary. See M 1526.
1130 Radio Japan: Radio Japan Magazine Hour. See M 0315.
1134 Deutsche Welle: Hallo Africa. See M 1134.
1136 Radio Japan: Close Up. See M 0350.
1137 Radio Netherlands: Newsline. See S 0037.
1140 Radio Japan: Crosscurrents. See M 1140.
1152 Radio Netherlands: Media Network. See H 0152.

Fridays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1130 Radio Japan: Radio Japan Magazine Hour. See M 0315.
1134 Deutsche Welle: Hallo Africa. See M 1134.
1137 Radio Netherlands: Newsline. See S 0037.
1143 Radio Japan: Close Up. See M 0350.
1152 Radio Netherlands: Towards 2000. A focus on the global aspects of social change.

Saturdays

1109 Deutsche Welle: The Week in Germany. See A 0212.
1110 Radio Japan: This Week. See S 0110.
1120 Deutsche Welle: Mailbag Africa. Listener mail from Africa is answered.
1130 Radio Japan: The Week in Review. See A 0330.
1134 Deutsche Welle: The Jazz Corner. See A 0237.
1137 Radio Netherlands: Newsline. See S 0037.
1152 Radio Netherlands: Sounds Interesting. See S 0052.



Our thanks to Donald Michael Choleva for sending this QSL from Radio France International.

1200 UTC SHORTWAVE GUIDE 7:00 AM EST 4:00 AM PST

FREQUENCIES

1200-1230	Australia, Radio	5995pa	6060pa	6080pa	9580pa
		9610as	11800pa	15565as	
1200-1300 vl	Australia, VL8A Alice Spg	2310do			
1200-1300 vl	Australia, VL8K Katherine	2485do			
1200-1300 vl	Australia, VL8T Tent Crk	2325do			
1200-1300	Bahrain, Radio	6010do			
1200-1300	Brazil, Radiobras	15445na			
1200-1215	Cambodia, Natl Voice of	11940as			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZN St John's	6160do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1300	China, China Radio Intl	9655na	9715as	11660as	11795pa
		15440pa			
1200-1300	Costa Rica, R Peace Intl	7385am	9400am	15030am	
1200-1300	Ecuador, HCJB Quito	15115am	17890am	21455pa	
1200-1300	France, Radio France Intl	9805eu	11615na	13625af	15155eu
		15195eu	15365na		
1200-1300 vl	Guatemala, AWR	5980ca			
1200-1300 vl	Italy, IRRS Milan	7125eu			
1200-1300	Jordan, Radio	9560eu			
1200-1300	Malaysia, Radio	7295do			
1200-1300	Malaysia, RTM/Kota Kinaba	5980do			
1200-1230 tfa	Mongolia, R Ulan Bator	7295na	12000na		
1200-1300	Netherlands, Radio	6045eu	7130eu		
1200-1206 mtwhf	New Zealand, R NZ Intl	9700pa			
1200-1230	Nigeria, FRCN/Radio	4990do	7285do		
1200-1230 s	Norway, Radio Norway Intl	11850as	15165au		
1200-1300 mtwhf	Palau, KHBN/Voice of Hope	9830as			
1200-1230 a	Palau, KHBN/Voice of Hope	9830as			
1200-1300 vl	Papua New Guinea, NBC	4890do	9675do		
1200-1300	Russia, Voice of	5960eu	7160na	7205na	9470eu
		9540eu	9550eu	9680eu	9800eu
		11675af	11710as	11760eu	11980eu
		12015af	13370eu	15190af	15495af
1200-1300	Singapore, SBC Radio One	6155do			
1200-1300	Singapore,R Singapore Int	9530as			
1200-1300	South Korea, R Korea Intl	7180as			
1200-1230	Switzerland, Swiss R Intl	6165eu	9535eu		
1200-1300	Taiwan, VO Free China	7130au	9610as		
1200-1300	United Kingdom,BBC London	6190af	6195na	7160as	9410eu
		9515na	9740as	9760eu	11750as
		11760me	11940af	12095af	15070eu
		15220na	15310as	15575as	17640eu
		17790af	17885af	21660na	
1200-1300	USA, KAIJ Dallas TX	9815am	13815am		
1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300	USA, KWHR Naalehu HI	9930as			
1200-1300	USA, Monitor Radio Intl	6095na	9455na		
1200-1300	USA, VOA Washington DC	6110as	9645as	9760as	11715as
		15160as	15425as		
1200-1300	USA, WEWN Birmingham AL	9350na	9985ca	15695na	
1200-1300 vl	USA, WHRI Noblesville IN	6040am	9850am		
1200-1300	USA, WJCR Upton KY	7490na	13595na		
1200-1300 s	USA, WRMI/R Miami Intl	9955am			
1200-1300	USA, WWCR Nashville TN	5065am	13845am	15685am	
1200-1300	USA, WYFR Okeechobee FL	5950na	7355na	11790na	11830na
1200-1230	Uzbekistan, R Tashkent	6025eu	9715eu	13785eu	
1207-1300 occsnal	New Zealand, R NZ Intl	9700pa			
1215-1300	Egypt, Radio Cairo	17595as			
1220-1229 vl	Ghana, Ghana Broadc Corp	4915do			
1230-1300	Australia, Radio	5995pa	6060pa	7260as	11800pa
		15565as			
1230-1300	Austria, R Austria Intl	6155eu	11780as	13730na	
1230-1300	Bangladesh, Radio	9650as	13615as		
1230-1300	Bulgaria, Radio	9770as	11740as		
1230-1300	Canada, RCI Montreal	6150as	11730as		
1230-1300	Finland, YLE/Radio	11735na	11740na	15400na	
1230-1300	Ghana, Ghana Broadc Corp	6130do	7295do		
1230-1300	Russia, Voice of	6000eu	6060eu		
1230-1300	South Korea, R Korea Intl	9570as	11740as	13670eu	
1230-1300	Sweden, Radio	13775au	15120as	15240as	
1230-1300	Vietnam, Voice of	10059as	12025as	15010as	
1240-1250	Greece, Voice of	11645af	15630af	15650af	

SELECTED PROGRAMS

Sundays

1215 Radio France Int I: Spotlight on Africa. Correspondent reports and interviews on African affairs.
1220 Radio France Int I: Report on Asia. Correspondent reports and interviews on Asian affairs.
1225 Radio Netherlands: Program Info. See S 0125.
1233 Radio France Int I: Club 9516. Listener letters are read in this mailbag program.
1235 Radio Netherlands: They're Playing My Song. See S 0235.
1253 Radio Netherlands: EuroQuest. See S 0253.

Mondays

1225 Radio Netherlands: Press Review. See S 1525.
1230 Radio Finland: Compass North. See S 2330.
1231 Radio France Int I: RFI Europe. European press review focuses on current affairs in other countries of the region.
1237 Radio Netherlands: Newsline. See S 0037.
1238 Radio France Int I: Sports. Weekend sports results on Mondays and sports news on Thursdays.
1240 Radio Finland: Economic Comments in the Finnish Press. Media coverage of business, finance and trade.
1245 Radio Finland: Business Monday. Summary of the previous week's business news.
1247 Radio France Int I: North/South (biweekly). Focus on a public activity in France.
1247 Radio France Int I: Planet Earth (biweekly). An interview with an expert on ecological matters.
1250 Radio Finland: Closeup. Focus on an aspect of life in Finland.
1252 Radio Netherlands: Let's Get to Business. Down-to-earth program of trade and business with Barry O'Dwyer.

Tuesdays

1225 Radio Netherlands: Press Review. See S 1525.
1230 Radio Finland: Compass North. See S 2330.
1231 Radio France Int I: France Today. Current happenings in France.
1233 Radio France Int I: RFI Europe. See M 1231.
1237 Radio Netherlands: Newsline. See S 0037.
1240 Radio Finland: Finnish Press Review. Editorial opinion and reports on Finnish and world events.
1240 Radio France Int I: Books. New books, publishing trends, and authors.
1245 Radio Finland: Sports News. News from the world of sports.
1247 Radio France Int I: Science Notes. Developments in the world of science, technology, and health.
1250 Radio Finland: Northern Lights. A closeup on life in Finland.
1252 Radio Netherlands: Accent on Asia. See T 0152.

Wednesdays

1225 Radio Netherlands: Press Review. See S 1525.
1230 Radio Finland: Compass North. See S 2330.
1231 Radio France Int I: RFI Europe. See M 1231.
1231 Radio France Int I: RFI Europe. See M 1231.
1237 Radio Netherlands: Newsline. See S 0037.
1240 Radio Finland: Finnish Press Review. See T 1240.
1241 Radio France Int I: The Bottom Line. Focus on financial matters.
1245 Radio Finland: Environmental News. See T 2345.
1247 Radio France Int I: Land of France. A feature on life and times in France.
1250 Radio Finland: Northern Lights. See T 1250.
1252 Radio Netherlands: Encore!. Reruns of the best programs from earlier seasons.

Thursdays

1225 Radio Netherlands: Press Review. See S 1525.
1230 Radio Finland: Compass North. See S 2330.
1231 Radio France Int I: Sports. See M 1238.
1234 Radio France Int I: RFI Europe. See M 1231.
1237 Radio Netherlands: Newsline. See S 0037.
1240 Radio Finland: Finnish Press Review. See T 1240.
1244 Radio France Int I: The Americas Magazine. NEW! Focus on a subject relating to a country of the western hemisphere.
1245 Radio Finland: Finnish History. See W 2345.
1249 Radio France Int I: Arts in France. Profile on the work of a French artist or a cultural activity such as music.
1249 Radio France Int I: North/South (biweekly). See M 1247.
1250 Radio Finland: Northern Lights. See T 1250.
1252 Radio Netherlands: Research File. See M 1152.

Fridays

1225 Radio Netherlands: Press Review. See S 1525.
1230 Radio Finland: Compass North. See S 2330.
1231 Radio France Int I: RFI Europe. See M 1231.
1237 Radio Netherlands: Newsline. See S 0037.
1240 Radio Finland: Finnish Press Review. See T 1240.
1241 Radio France Int I: Film Reel. Interview with an performer or film maker.
1245 Radio Finland: YLE Media Roundup. The latest news about satellite broadcasting.
1248 Radio France Int I: Made in France. See H 1447.
1250 Radio Finland: Northern Lights. See T 1250.
1254 Radio Netherlands: Documentary. See W 1154.

Saturdays

1225 Radio Netherlands: EuroPress Review. See A 0125.
1228 Radio France Int I: Spotlight on Africa. See S 1215.
1230 Radio Finland: Compass North. See S 2330.
1237 Radio Netherlands: Newsline. See S 0037.
1242 Radio Finland: Focus. See S 0535.
1247 Radio France Int I: French Lesson. Learn French by radio.
1252 Radio Netherlands: Bats; Balls & Baselines. See A 0252.

HAUSER'S HIGHLIGHTS:
PORTUGAL

RDP International Features
Mon, *Visitor's Notebook*;
Tue, *Musical Kaleidoscope*;
Wed, *Challenge of the 90's*;
Thu, *Spotlight on Portugal*;
Fri, *Listener's Mailbag* alternating with *DX Program, Collector's Corner*
—next UT Day 0245 on 9570, 9705 to us
(via Bob Thomas, CT)

FREQUENCIES

1300-1400	Australia, Radio	5995pa	7240as	9610as	11800pa
1300-1330	Australia, Radio	6060pa	6080as		
1300-1400 vl	Australia, VL8A Alice Spg	2310do			
1300-1400 vl	Australia, VL8K Katherine	2485do			
1300-1400 vl	Australia, VL8T Tent Crk	2325do			
1300-1400	Bahrain, Radio	6010do			
1300-1320	Brazil, Radiobras	15445na			
1300-1330	Bulgaria, Radio	9770as	11740as		
1300-1400 vl	Canada, CBC N Quebec Sce	9625do			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZN St John's	6160do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400 s	Canada, RCI Montreal	11855na	17820na		
1300-1400	China, China Radio Intl	9715as	11660as	15440pa	
1300-1400 vl	Costa Rica, R Peace Intl	7385am	9400am	15030am	
1300-1400	Ecuador, HCJB Quito	15115am	17890am	21455eu	
1300-1330	Egypt, Radio Cairo	17595as			
1300-1330	Ghana, Ghana Broadc Corp	3366do	4915do		
1300-1400 vl	Guatemala, AWR	5980ca			
1300-1400 vl	Italy, IRRS Milan	7125eu			
1300-1400 mtwhfa	Lebanon, Wings of Hope	9960me			
1300-1400	Malaysia, Radio	7295do			
1300-1400	Malaysia, RTM/Kota Kinaba	5980do			
1300-1325	Moldova, R Moldova Intl	15390na			
1300-1325	Netherlands, Radio	6045eu	7130eu		
1300-1306 occsnal	New Zealand, R NZ Intl	9700pa			
1300-1330 s	Norway, Radio Norway Intl	9590eu			
1300-1400 mtwhf	Palau, KHBN/Voice of Hope	9830as			
1300-1400	Papua New Guinea, NBC	4890do	9675do		
1300-1400	Philippines, FEBC/R Intl	11995as			
1300-1355	Poland, Polish R Warsaw	6135eu	7145eu	7270eu	9525eu
		11815eu			
1300-1400	Romania, R Romania Intl	11940eu	15365eu	17720eu	
1300-1400	Russia, Voice of	4740as	4795as	6000eu	6060eu
		7160as	7205eu	7210eu	7295eu
		7335eu	9540na	9550eu	9680eu
		9830eu	11710as	11765as	11865me
		12065na	13370as	15140eu	15150as
		15265eu	15320eu	15460eu	15470me
		15560me	17720eu	17775eu	
1300-1400	Singapore, SBC Radio One	6155do			
1300-1400	Singapore,R Singapore Int	9530as			
1300-1330	Switzerland, Swiss R Intl	7250as	7480as	11640as	13635as
1300-1400	United Kingdom,BBC London	6190af	6195na	7160as	7180as
		9410eu	9515na	9580as	9740as
		11750as	11760me	11765as	11820na
		11940af	12095eu	15070eu	15220na
		15310as	15420af	15575me	17640eu
		17705eu	17790af	17840na	17880af
		17885af	21470af	21660af	
1300-1400	USA, KAIJ Dallas TX	9815am	13815am		
1300-1400 vl	USA, KJES Mesquite NM	11715na			
1300-1400	USA, KNLS Anchor Point AK	7365as			
1300-1400	USA, KTBN Salt Lk City UT	7510am			
1300-1400	USA, Monitor Radio Intl	6095na	9455na		
1300-1400	USA, VOA Washington DC	6110as	9645as	9760as	11805as
		15160as	15425as		
1300-1400	USA, WEWN Birmingham AL	9350na	15695na		
1300-1400	USA, WHRI Noblesville IN	6040am	9930am	15105am	
1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400 s	USA, WRMI/R Miami Intl	9955am			
1300-1400	USA, WWCR Nashville TN	5065am	9475am	13845am	15685am
1300-1400	USA, WYFR Okeechobee FL	5950na	9705na	11550na	11830na
		11970na	13695af		
1307-1400 occsnal	New Zealand, R NZ Intl	9655pa			
1330-1400	Austria, R Austria Intl	15450as			
1330-1400 s	Belgium, R Vlaanderen Int	13675na			
1330-1400	Finland, YLE/Radio	11735na	15400na	17740na	
1330-1400 tw	Ghana, Ghana Broadc Corp	4915do			
1330-1400	India, All India Radio	13732as	15120as		
1330-1400	Netherlands, Radio	9895as	13700as	15150as	
1330-1400	Sweden, Radio	11650na	15240na		
1330-1400	Switzerland, Swiss R Intl	6165eu	9535eu		
1330-1400	Turkey, Voice of	9675as			
1330-1355	UAE, Radio Dubai	13675eu	15320eu	15395as	21605as
1330-1400	Uzbekistan, R Tashkent	6020eu	9715eu	13785eu	
1330-1400	Vietnam, Voice of	10059as	12025as	15010as	
1345-1400	Vatican State, Vatican R	11625as	12050as	15585pa	
1355-1400 vl	Liberia, Radio ELBC	7275do			

SELECTED PROGRAMS

Sundays

1335 Radio Finland: Russian/Baltic Affairs in the Finnish Press. Media comments about Finland's neighbors.
1336 Radio Netherlands: Happy Station. See S 0137.
1343 Radio Finland: Starting Finnish. Finnish language lessons for English speakers.
1351 Radio Finland: Nunti Latini. The only program on shortwave in Latin.

Mondays

1308 Radio Netherlands: From Sapphire to Laser. NEW! Robert Green takes an issue and illustrates how composers have tackled the subject.
1310 Radio Canada Int'l: The Mailbag. See S 1437.
1330 Radio Finland: Compass North. See S 2330.
1337 Radio Canada Int'l: Innovation Canada. See S 0307.
1337 Radio Netherlands: Newsline. See S 0037.
1340 Radio Finland: Economic Comments in the Finnish Press. See M 1240.
1345 Radio Finland: Business Monday. See M 1245.
1350 Radio Finland: Closeup. See M 1250.
1352 Radio Netherlands: Research File. See M 1152.

Tuesdays

1310 Radio Canada Int'l: As It Happens. See M 2330.
1330 Radio Finland: Compass North. See S 2330.
1337 Radio Netherlands: Newsline. See S 0037.
1340 Radio Finland: Finnish Press Review. See T 1240.
1345 Radio Finland: Sports News. See T 1245.
1350 Radio Finland: Northern Lights. See T 1250.
1352 Radio Netherlands: Accent on Asia. See T 0152.

Wednesdays

1310 Radio Canada Int'l: As It Happens. See M 2330.
1330 Radio Finland: Compass North. See S 2330.
1337 Radio Netherlands: Newsline. See S 0037.
1340 Radio Finland: Finnish Press Review. See T 1240.
1345 Radio Finland: Environmental News. See T 2345.
1350 Radio Finland: Northern Lights. See T 1250.
1354 Radio Netherlands: Documentary. See W 1154.

Thursdays

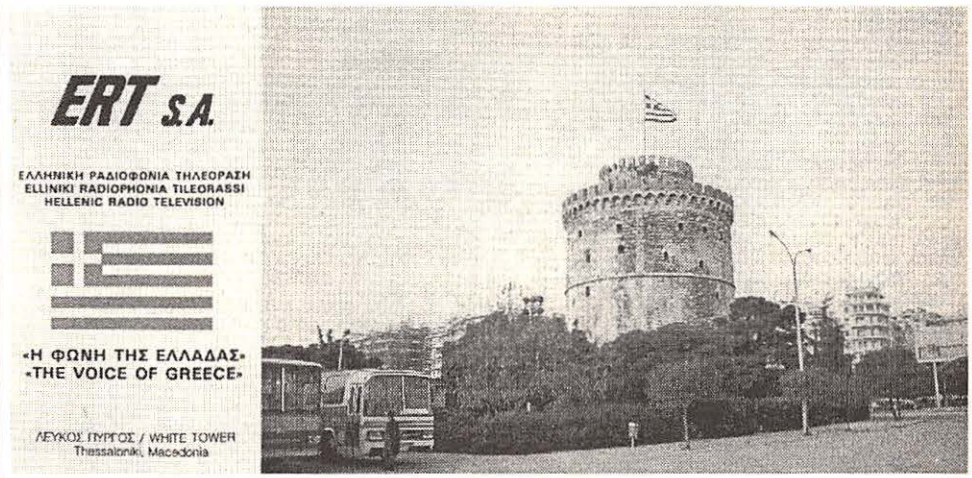
1310 Radio Canada Int'l: As It Happens. See M 2330.
1330 Radio Finland: Compass North. See S 2330.
1337 Radio Netherlands: Newsline. See S 0037.
1340 Radio Finland: Finnish Press Review. See T 1240.
1345 Radio Finland: Finnish History. See W 2345.
1350 Radio Finland: Northern Lights. See T 1250.
1352 Radio Netherlands: Media Network. See H 0152.

Fridays

1310 Radio Canada Int'l: As It Happens. See M 2330.
1330 Radio Finland: Compass North. See S 2330.
1337 Radio Netherlands: Newsline. See S 0037.
1340 Radio Finland: Finnish Press Review. See T 1240.
1345 Radio Finland: YLE Media Roundup. See F 1245.
1350 Radio Finland: Northern Lights. See T 1250.
1352 Radio Netherlands: Towards 2000. See F 1152.

Saturdays

1330 Radio Finland: Compass North. See S 2330.
1337 Radio Netherlands: Newsline. See S 0037.
1342 Radio Finland: Focus. See S 0535.
1352 Radio Netherlands: Sounds Interesting. See S 0052.



Another fine QSL from Donald Choleva—this one from Athens, Greece.

1400 UTC SHORTWAVE GUIDE 9:00 AM EST 6:00 AM PST

FREQUENCIES

1400-1430	Australia, Radio	5995pa	7240pa	9610pa	9710pa
		11800pa			
1400-1500 vl	Australia, VL8A Alice Spg	2310do			
1400-1500 vl	Australia, VL8K Katherine	2485do			
1400-1500 vl	Australia, VL8T Tent Crk	2325do			
1400-1500	Bahrain, Radio	6010do			
1400-1430 mtwhfa	Belgium, R Vlaanderen Int	13675na			
1400-1500 vl	Canada, CBC N Quebec Sce	9625do			
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZN St John's	6160do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1500 s	Canada, RCI Montreal	11955na	17820na		
1400-1500	China, China Radio Intl	7405na	9785as	11815as	15165as
1400-1430	Ecuador, HCJB Quito	15115am	21455eu		
1400-1500	France, Radio France Intl	7110eu	12030eu	17560me	
1400-1420	Ghana, Ghana Broadc Corp	3366do	4915do		
1400-1500	Guam, KSDA/AWR	9370as			
1400-1500 vl	Guatemala, AWR	5980ca			
1400-1500	India, All India Radio	13732as	15120as		
1400-1425 smtwh	Israel, Kol Israel	15640na	15650au		
1400-1500 vl	Italy, IRRS Milan	7125eu			
1400-1500	Japan, NHK/Radio	9535na	9750as	11705na	11840as
		11915as			
1400-1500 mtwhfa	Lebanon, Wings of Hope	9960me			
1400-1500	Malaysia, Radio	7295do			
1400-1500	Malaysia, RTM Kuching	7160do			
1400-1500	Malaysia, RTM/Kota Kinaba	5980do			
1400-1500	Malta, V of Mediterranean	11925eu			
1400-1500 s	Morocco, RTV Marocaine	17595af			
1400-1500	Netherlands, Radio	9895as	13700as	15150as	
1400-1500 occsnal	New Zealand, R NZ Intl	9655pa			
1400-1405	Nigeria, FRCN/Radio	4990do	7285do		
1400-1430 mtwhf	Palau, KHBN/Voice of Hope	9830as			
1400-1500	Philippines, FEBC/R Intl	11995as			
1400-1500	Russia, Voice of	5960as	6000eu	6060eu	6065as
		7185eu	7210as	7350as	9550na
		9635as	9810eu	9830na	11760na
		11925na	12015as	12065eu	15140as
		15205na	15265na	15450na	15465eu
	15560na	17780af			
1400-1500	Singapore, SBC Radio One	6155do			
1400-1500 vl	Slovakia, AWR	9455af			
1400-1500	South Korea, R Korea Intl	5975as	7275as	11740as	
1400-1420	Turkey, Voice of	9675as			
1400-1500	United Kingdom,BBC London	5990as	6195as	7180as	9410eu
		9515na	9660eu	9740as	9750eu
		11750as	11820as	11940af	12095eu
		15070eu	15260af	15310me	15400af
		15575me	17640af	17705eu	17790af
		17840af	17880af	21660af	
1400-1500	USA, KAIJ Dallas TX	13815am	15725am		
1400-1500 vl	USA, KJES Mesquite NM	11715na			
1400-1500	USA, KTBN Salt Lk City UT	7510na			
1400-1500	USA, VOA Washington DC	6110as	7215as	9645as	9760as
		15160as	15205as	15395as	15425as
1400-1500	USA, WEWN Birmingham AL	7425na			
1400-1500 vl	USA, WHRI Noblesville IN	6040am	9930am	15105am	
1400-1500	USA, WJCR Upton KY	7490na	13595na		
1400-1500	USA, WRMI/R Miami Intl	9955am			
1400-1500	USA, WWCR Nashville TN	5065am	13845am	15685am	
1400-1500	USA, WYFR Okeechobee FL	9705na	11550na	11830na	17760na
1415-1500 mtwtfa	Bhutan, Bhutan BC Service	5025do			
1430-1500	Australia, Radio	5995pa	6060pa	6080pa	7260as
		9710pa	9770as	11660as	11695pa
		11800pa			
1430-1500	Canada, RCI Montreal	9555me	11935me	15315af	15325me
		17820af			
1430-1500	Ecuador, HCJB Quito	6080do	17890am	21455eu	
1430-1500	Finland, YLE/Radio	11735na	15400na	17740na	
1430-1500 s	Ghana, Ghana Broadc Corp	3366do			
1430-1455	Moldova, R Moldova Intl	11775eu			
1430-1500	Myanmar, Radio	5990do	7185do		
1430-1500	Romania, R Romania Intl	11775as	15335as	17720as	
1430-1500	Sweden, Radio	11650na	15240na		
1435-1445	Greece, Voice of	15650na	17520na		
1445-1500	Mongolia, R Ulan Bator	7295na	12000na		

SELECTED PROGRAMS

Sundays

1410 Radio Japan: Let's Learn Japanese. See S 0315.
1411 Radio Canada Int'l: Sunday Morning. A magazine program covering virtually everything under the sun.
1418 Radio France Int l: Spotlight on Africa. See S 1215.
1425 Radio Japan: Media Roundup. See S 0525.
1425 Radio Netherlands: Program Info. See S 0125.
1432 Radio France Int l: Club 9516. See S 1233.
1435 Radio Netherlands: They're Playing My Song. See S 0235.
1437 Radio Canada Int'l: The Mailbag. Listener letters, musical selections, and happenings in Canada.
1450 Radio Japan: Viewpoint. See S 0350.
1453 Radio Netherlands: EuroQuest. See S 0253.
1455 Radio Japan: Tokyo Pop-In. See S 0155.

Mondays

1410 Radio Japan: Today's Top News Asia. Five minutes of current Asian news.
1415 Radio Japan: Current Views. See M 0515.
1420 Radio Japan: Spectrum. See M 0520.
1425 Radio Netherlands: Program Info. See S 0125.
1431 Radio France Int l: RFI Europe. See M 1231.
1437 Radio Netherlands: Newsline. See S 0037.
1438 Radio France Int l: Sports. See M 1238.
1440 Radio Canada Int'l: Spectrum. A weekday magazine program of current affairs, features, and a business report.
1446 Radio France Int l: North/South (biweekly). See M 1247.
1446 Radio France Int l: Planet Earth (biweekly). See M 1247.
1452 Radio Netherlands: Let's Get to Business. See M 1252.
1455 Radio Japan: Tokyo Pop-In. See S 0155.

Tuesdays

1410 Radio Japan: Today's Top News Asia. See M 1410.
1415 Radio Japan: Enjoy Japanese. See T 0520.
1425 Radio Netherlands: Program Info. See S 0125.
1431 Radio France Int l: France Today. See T 1231.
1433 Radio France Int l: RFI Europe. See M 1231.
1437 Radio Netherlands: Newsline. See S 0037.
1440 Radio Canada Int'l: Spectrum. See M 1440.
1440 Radio France Int l: Books. See T 1240.
1447 Radio France Int l: Science Notes. See T 1247.
1452 Radio Netherlands: Mirror Images. See T 1152.
1455 Radio Japan: Tokyo Pop-In. See S 0155.

Wednesdays

1410 Radio Japan: Today's Top News Asia. See M 1410.
1415 Radio Japan: Current Views. See M 0515.
1420 Radio Japan: Spectrum. See M 0520.
1425 Radio Netherlands: Program Info. See S 0125.
1431 Radio France Int l: RFI Europe. See M 1231.
1437 Radio Netherlands: Newsline. See S 0037.
1439 Radio France Int l: Counterpoint. A specific human rights issue is examined.
1440 Radio Canada Int'l: Spectrum. See M 1440.
1446 Radio France Int l: Land of France. See W 1247.
1452 Radio Netherlands: Encore!. See W 1252.
1455 Radio Japan: Tokyo Pop-In. See S 0155.

Thursdays

1410 Radio Japan: Today's Top News Asia. See M 1410.
1415 Radio Japan: Current Views. See M 0515.
1420 Radio Japan: Enjoy Japanese. See T 0520.
1425 Radio Netherlands: Music Break. See S 0225.
1431 Radio France Int l: Sports. See M 1238.
1433 Radio France Int l: RFI Europe. See M 1231.
1437 Radio Netherlands: Newsline. See S 0037.
1440 Radio Canada Int'l: Spectrum. See M 1440.
1441 Radio France Int l: Arts in France. See H 1249.
1447 Radio France Int l: Made in France. A review of something very French.
1452 Radio Netherlands: Research File. See M 1152.
1455 Radio Japan: Tokyo Pop-In. See S 0155.

Fridays

1410 Radio Japan: Today's Top News Asia. See M 1410.
1415 Radio Japan: Current Views. See M 0515.
1420 Radio Japan: The Travel and Book Beat. The weekly magazine program that focuses on tourism and literature.
1421 Radio Japan: Japan Travelogue. See F 0521.
1425 Radio Netherlands: Program Info. See S 0125.
1431 Radio France Int l: RFI Europe. See M 1231.
1435 Radio Japan: Short Story. See F 0535.
1437 Radio Netherlands: Newsline. See S 0037.
1440 Radio Canada Int'l: Spectrum. See M 1440.
1441 Radio France Int l: Drumbeat (biweekly). See T 1647.
1441 Radio France Int l: Silk Roads (biweekly). See T 1647.
1445 Radio Japan: Book Review. See F 0545.
1446 Radio France Int l: Film Reel. See F 1241.
1452 Radio Netherlands: Documentary. See W 1154.
1455 Radio Japan: Tokyo Pop-In. See S 0155.

Saturdays

1410 Radio Japan: This Week. See S 0110.
1425 Radio France Int l: Focus on France. Zooming in on a French news item.
1425 Radio Netherlands: Music Break. See S 0225.
1432 Radio France Int l: Report on Asia. See S 1220.
1437 Radio Canada Int'l: Innovation Canada. See S 0307.
1437 Radio Netherlands: Newsline. See S 0037.
1444 Radio France Int l: French Lesson. See A 1247.
1447 Radio Japan: Music Gallery. See S 0147.
1452 Radio Netherlands: Bats; Balls & Baselines. See A 0252.

HAUSER'S HIGHLIGHTS: SWITZERLAND

- SRI resumed features during Saturday *Newsnets*, plus UT Suns 0112-0125 and 0412-0425 on 9905, 9885, 6135
- Mailbag *Capital Letters* 2nd and 4th Sats sends bouquets by Interflora™ to three lucky participants
- *Name Game* quiz on first Sat;
- *Sounds Good* Swiss rock music 3rd Sat (gh, *WOR*)
- Sometimes missing from UT Sun 0412 repeat (Kevin Hecht)
- SRI news reports its budget has been maintained by raising the annual license fee. (Joe Hanlon, PA)

FREQUENCIES

1500-1600	Australia, Radio	5995pa	6060pa	6080pa	7260as
		9710pa	9770as	11660as	11695pa
		11800pa			
1500-1600 vl	Australia, VL8A Alice Spg	2310do			
1500-1600 vl	Australia, VL8K Katherine	2485do			
1500-1600 vl	Australia, VL8T Tent Crk	2325do			
1500-1600	Bahrain, Radio	6010do			
1500-1600 vl	Canada, CBC N Quebec Sce	9625do			
1500-1600	Canada, CFCX Montreal	6005do			
1500-1600	Canada, CFRX Toronto	6070do			
1500-1600	Canada, CFVP Calgary	6030do			
1500-1600	Canada, CHNX Halifax	6130do			
1500-1600	Canada, CKZN St John's	6160do			
1500-1600	Canada, CKZU Vancouver	6160do			
1500-1600 s	Canada, RCI Montreal	11955na	17820na		
1500-1600	China, China Radio Intl	7405na	9785as	11815as	15165as
1500-1600	Ecuador, HCJB Quito	6080do	15115am	17490eu	21455eu
1500-1550	Germany, Deutsche Welle	7195af	9735af	11965af	15145af
		17800af			
1500-1600	Guam, KSDA/AWR	9370as			
1500-1600 mt	Guam, KTWR Agana	11580as			
1500-1600	Iraq, Radio Iraq Intl	15250as			
1500-1600	Italy, AWR Europe	7230eu			
1500-1600 vl	Italy, IRRS Milan	7125eu			
1500-1600	Japan, NHK/Radio	9535na	9750as	11955as	15355af
1500-1600	Jordan, Radio	9560eu			
1500-1600 mtwhfa	Lebanon, Wings of Hope	9960me			
1500-1600	Malaysia, Radio	7295do			
1500-1600	Malaysia, RTM Kuching	7160do			
1500-1600	Malaysia, RTM/Kota Kinaba	5980do			
1500-1600	Malta, V of Mediterranean	11925eu			
1500-1515	Mongolia, R Ulan Bator	7295as	12000as		
1500-1525	Netherlands, Radio	9895as	13700as	15150as	
1500-1600 occsnal	New Zealand, R NZ Intl	9655pa			
1500-1530	Nigeria, FRCN/Radio	4990do	7285do		
1500-1600	Nigeria, FRCN/Voice of	7255af			
1500-1600	Palau, KHBN/Voice of Hope	9965as			
1500-1600	Philippines, FEBC/R Intl	11995as			
1500-1530	Romania, R Romania Intl	11775as	15335as	17720as	

1500-1600	Russia, Voice of	4740as	4795as	4940as	5935eu
		7115na	7165eu	7180eu	7295eu
		7330eu	7360eu	9575eu	9635eu
		9835na	9885na	11765as	11825af
		12015eu	12065me	15205na	15265ns
		15320as	15465eu	15480as	
1500-1600	S Africa, Channel Africa	7225af			
1500-1550	Seychelles, FEBA Radio	9810as	11870as		
1500-1600	Seychelles, FEBA Radio	11870as			
1500-1600	Singapore, SBC Radio One	6155do			
1500-1600 vl	Slovakia, AWR	9455af			
1500-1600	Sri Lanka, SLBC Colombo	9720as	15425as		
1500-1530	Switzerland, Swiss R Intl	9885as	12075as	13635as	
1500-1600	United Kingdom,BBC London	5990as	6190af	6195as	7180as
		9410eu	9515na	9740as	11750as
		11940af	12095eu	15070af	15260na
		15310as	15400af	15420af	17705eu
		17840na	17880af	21470af	21490af
		21660af			
1500-1600	USA, KAIJ Dallas TX	13815am	15725am		
1500-1600	USA, KTBN Salt Lk City UT	7510na			
1500-1600	USA, KWHR Naalehu HI	9930as			
1500-1600	USA, VOA Washington DC	6110as	7125as	7215as	9645as
		9700as	9760as	15205me	15395as
1500-1600	USA, WCSN Scotts Cor ME	15665eu			
1500-1600	USA, WEWN Birmingham AL	7425na			
1500-1600	USA, WHRI Noblesville IN	13760am	15105am		
1500-1600	USA, WJCR Upton KY	7490na	13595na		
1500-1600	USA, WWCR Nashville TN	13845am	15685am		
1500-1600	USA, WYFR Okeechobee FL	11830na	15215na	17760ca	
1525-1530 twhf	Philippines, Veritas Asia	15140as			
1530-1600	Austria, R Austria Intl	6155eu	9880me	11780as	13730eu
1530-1545	India, All India Radio	7140as	7412as	9910as	11670me
1530-1600	Netherlands, Radio	9895as	15150as		
1530-1600 mtwhf	Portugal, Radio	21515me			
1530-1600	Russia, Voice of	6005af	6110af	7150af	7205eu
		9800eu			
1540-1555 asm	Philippines, Veritas Asia	15140as			
1545-1600	Vatican State, Vatican R	9500as	11640as		

SELECTED PROGRAMS

Sundays

1505 Radio Canada Int'l: Sunday Morning (Centerpoint). A feature program segment of the CBC Sunday Morning program.
1509 Deutsche Welle: Religion and Society. See S 0137.
1510 Radio Japan: Hello from Tokyo. See S 0310.
1518 Deutsche Welle: Through German Eyes. In-depth interviews with prominent German journalists.
1525 Radio Netherlands: Press Review. Summary of items in the Dutch media.
1534 Deutsche Welle: Hits in Germany. The German pop scene for listeners in Africa.
1536 Radio Netherlands: Happy Station. See S 0137.
1550 Radio Japan: Viewpoint. See S 0350.
1555 Radio Japan: Tokyo Pop-In. See S 0155.

Mondays

1508 Deutsche Welle: Newsline Cologne. See M 1109.
1508 Radio Netherlands: From Sapphire to Laser. See M 1308.
1510 Radio Japan: Today's Top News Asia. See M 1410.
1515 Radio Japan: Radio Japan Magazine Hour. See M 0315.
1519 Radio Japan: News Commentary. See M 0515.
1525 Radio Netherlands: Press Review. See S 1525.
1526 Radio Japan: Japan Diary. An interesting segment of the Magazine Hour about life in Japan.
1528 Deutsche Welle: Weekend Sport. All the latest scores of the seasonal matches.
1538 Deutsche Welle: Monday Special. Interview or report on events or developments in African affairs.
1538 Radio Netherlands: Newsline. See S 0037.
1552 Radio Netherlands: Research File. See M 1152.
1555 Radio Japan: Tokyo Pop-In. See S 0155.

Tuesdays

1508 Deutsche Welle: Newsline Cologne. See M 1109.
1510 Radio Japan: Today's Top News Asia. See M 1410.
1515 Radio Japan: Radio Japan Magazine Hour. See M 0315.
1519 Radio Japan: News Commentary. See M 0515.
1525 Radio Netherlands: Press Review. See S 1525.
1526 Radio Japan: Japan Diary. See M 1526.
1530 Radio Japan: Japanese Culture Today. See T 1137.
1533 Deutsche Welle: Insight. A weekly analysis of major developments on the international scene.
1538 Radio Netherlands: Newsline. See S 0037.
1544 Radio Japan: Close Up. See M 0350.
1553 Radio Netherlands: Composing...My Life!. A series of music programs highlighting the work of contemporary Dutch composers
1555 Radio Japan: Tokyo Pop-In. See S 0155.

Wednesdays

1508 Deutsche Welle: Newsline Cologne. See M 1109.
1510 Radio Japan: Today's Top News Asia. See M 1410.
1515 Radio Japan: Radio Japan Magazine Hour. See M 0315.
1519 Radio Japan: News Commentary. See M 0515.
1525 Radio Japan: Japan Diary. See M 1526.
1525 Radio Netherlands: Press Review. See S 1525.
1531 Radio Japan: Asian Report. See W 1130.
1534 Deutsche Welle: Living in Germany. See M 0118.
1538 Radio Netherlands: Newsline. See S 0037.
1543 Radio Japan: Close Up. See M 0350.
1554 Radio Netherlands: Documentary. See W 1154.
1555 Radio Japan: Tokyo Pop-In. See S 0155.

Thursdays

1508 Deutsche Welle: Newsline Cologne. See M 1109.
1510 Radio Japan: Today's Top News Asia. See M 1410.
1515 Radio Japan: Radio Japan Magazine Hour. See M 0315.
1519 Radio Japan: News Commentary. See M 0515.
1525 Radio Japan: Japan Diary. See M 1526.
1525 Radio Netherlands: Press Review. See S 1525.
1531 Radio Japan: Crosscurrents. See M 1140.
1534 Deutsche Welle: Spotlight on Sport. Weekly magazine program with background stories and coverage of important events.
1538 Radio Netherlands: Newsline. See S 0037.
1543 Radio Japan: Close Up. See M 0350.
1552 Radio Netherlands: Media Network. See H 0152.
1555 Radio Japan: Tokyo Pop-In. See S 0155.

Fridays

1508 Deutsche Welle: Newsline Cologne. See M 1109.
1510 Radio Japan: Today's Top News Asia. See M 1410.
1515 Radio Japan: Radio Japan Magazine Hour. See M 0315.
1519 Radio Japan: News Commentary. See M 0515.
1525 Radio Japan: Japan Diary. See M 1526.
1525 Radio Netherlands: Press Review. See S 1525.
1534 Deutsche Welle: Economic Notebook. See T 0333.
1538 Radio Netherlands: Newsline. See S 0037.
1543 Radio Japan: Close Up. See M 0350.
1552 Radio Netherlands: Towards 2000. See F 1152.
1555 Radio Japan: Tokyo Pop-In. See S 0155.

Saturdays

1509 Deutsche Welle: Africa in the German Press. See M 0432.
1510 Radio Japan: This Week. See S 0110.
1522 Radio Japan: Japan Scene. See A 0622.
1523 Deutsche Welle: Focus on Development (biweekly). Reports and interviews on projects and progress in Africa and Asia.
1523 Deutsche Welle: Woman on the Move (biweekly). A magazine promoting intercultural understanding and portraying the role of women in society.
1525 Radio Netherlands: EuroPress Review. See A 0125.
1530 Radio Japan: The Week in Review. See A 0330.
1533 Deutsche Welle: Science and Technology. See M 1634.
1538 Radio Netherlands: Newsline. See S 0037.
1551 Radio Netherlands: Sounds Interesting. See S 0052.

1600 UTC SHORTWAVE GUIDE 11:00 AM EST 8:00 AM PST

FREQUENCIES

1600-1700	Algeria, R Algiers Intl	11715eu	17745eu		
1600-1630	Australia, Radio	5995pa	6060pa	6080pa	7260as
		9710pa	9770as	11660pa	11695pa
		11800pa			
1600-1700 vl	Australia, VL8A Alice Spg	2310do			
1600-1700 vl	Australia, VL8K Katherine	2485do			
1600-1700 vl	Australia, VL8T Tent Crk	2325do			
1600-1700	Bahrain, Radio	6010do			
1600-1700 vl	Canada, CBC N Quebec Sce	9625do			
1600-1700	Canada, CFCX Montreal	6005do			
1600-1700	Canada, CFRX Toronto	6070do			
1600-1700	Canada, CFVP Calgary	6030do			
1600-1700	Canada, CHNX Halifax	6130do			
1600-1700	Canada, CKZN St John's	6160do			
1600-1700	Canada, CKZU Vancouver	6160do			
1600-1700 s	Canada, RCI	11955na	17820na		
1600-1700	China, China Radio Intl	11575af	15110af	15130af	
1600-1700	Ecuador, HCJB Quito	6080do	15350eu	21455eu	
1600-1700	Ethiopia, Radio	7165af	9560af		
1600-1700	France, Radio France Intl	6175eu	9485eu	11700af	11995eu
		12015af	15530me		
1600-1650	Germany, Deutsche Welle	6170as	7225as	7305as	9525as
		9585as	11795as		
1600-1615 mt	Guam, KTWR Agana	11580as			
1600-1700 vl	Italy, IRRS Milan	7125eu			
1600-1630	Jordan, Radio	9560eu			
1600-1630 mtwhfa	Lebanon, Wings of Hope	9960me			
1600-1700	Malaysia, Radio	7295do			
1600-1625	Netherlands, Radio	9895as	15150as		
1600-1649 occsnal	New Zealand, R NZ Intl	9655pa			
1600-1700	Nigeria, FRCN/Voice of	7255af			
1600-1630	Pakistan, Radio	9470me	11570af	13590af	15555as
		15675af	17660as		
1600-1700	Russia, Voice of	4740as	4975as	5935na	5950eu
		6000eu	6015eu	6055eu	6110eu
		7150na	7180as	7205na	7335as
		7350eu	7370eu	7380as	9550na
		9830af	9890eu	12015eu	15105af
		15205na	15265af	15320as	17780eu
1600-1700	S Africa, Channel Africa	7225af	15240af		
1600-1700	Singapore, SBC Radio One	6155do			
1600-1700 vl	Slovakia, AWR	9455af	11610af		
1600-1700	South Korea, R Korea Intl	5975as	9515af	9870af	
1600-1630	Sri Lanka, SLBC Colombo	9720as	15425as		
1600-1700	Swaziland, Trans World R	9500af			
1600-1645	UAE, Radio Dubai	11795af	13675eu	15435eu	21605eu
1600-1700	United Kingdom,BBC London	3915as	5990as	6190af	6195eu
		7160as	9410eu	9515na	9580as
		9740as	11750as	11940af	12095eu
		15070af	15260na	15310as	15400af
		17640af	17840af	17880af	21470af
		21660af			
1600-1700	USA, KAIJ Dallas TX	13815am	15725am		
1600-1700	USA, KTBN Salt Lk City UT	15590am			
1600-1700	USA, KWHR Naalehu HI	6120as			
1600-1700	USA, Monitor Radio Intl	21640af			
1600-1700	USA, VOA Washington DC	3970af	6110as	7125as	9645as
		9700as	9760as	11920af	12040af
		13710af	15205as	15225af	15320af
		15395as	15410af	15445af	17785af
		17895af			
1600-1700	USA, WCSN Scotts Cor ME	15665eu			
1600-1700	USA, WEWN Birmingham AL	13615na	15695eu		
1600-1700	USA, WHRI Noblesville IN	13760am	15105am		
1600-1700	USA, WINB Red Lion PA	15715eu			
1600-1700	USA, WJCR Upton KY	7490na	13595na		
1600-1700	USA, WRNO New Orleans LA	15420na			
1600-1700	USA, WWCR Nashville TN	13845am	15685eu		
1600-1700	USA, WYFR Okeechobee FL	11830na	15215na	15566eu	17760na
		21525af	21745eu		
1630-1700	Australia, Radio	6060pa	6080pa	7260as	9710pa
		9860pa	11660pa	11695pa	11800pa
1630-1700	Austria, R Austria Intl	11780as			
1630-1700	Canada, RCI Montreal	7150as	9550as		
1630-1700	Egypt, Radio Cairo	15255af			
1630-1700	Liberia, Radio ELWA	4760do			
1630-1700	Russia, Voice of	7380as	9550eu	9575eu	9890eu
1630-1700	United Kingdom,BBC London	3255af	5965as	5975as	7180as
		9630af	15420af		
1640-1650 s	Rwanda, Radio	6055do			
1645-1700	Tajikistan, Radio	7245as			
1650-1700 mtwhf	New Zealand, R NZ Intl	9655pa			

SELECTED PROGRAMS

Sundays
1605 Radio Canada Int'l: Sunday Morning. See S 1411.
1609 Deutsche Welle: Arts on the Air. See S 1109.
1618 Radio France Int l: Report on Asia. See S 1220.
1632 Radio France Int l: Club 9516. See S 1233.
1634 Deutsche Welle: German by Radio. See S 1134.

Mondays
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1631 Radio France Int l: RFI Europe. See M 1231.
1634 Deutsche Welle: Science and Technology. Magazine program presenting new developments in science and technology.
1638 Radio France Int l: Sports. See M 1238.
1646 Radio France Int l: North/South (biweekly). See M 1247.
1646 Radio France Int l: Planet Earth (biweekly). See M 1247.

Tuesdays
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1611 Radio France Int l: France Today. See T 1231.
1631 Radio France Int l: RFI Europe. See M 1231.
1634 Deutsche Welle: Man and Environment. Various topics relating to the environment in industrial and developing countries.
1641 Radio France Int l: Books. See T 1240.
1647 Radio France Int l: Drumbeat (biweekly). African feature.
1647 Radio France Int l: Silk Roads (biweekly). Focus on South Asia.

Wednesdays
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1634 Deutsche Welle: Insight. See T 1533.
1641 Radio France Int l: The Bottom Line. See W 1241.
1647 Radio France Int l: Land of France. See W 1247.

Thursdays
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1630 Radio France Int l: Sports. See M 1238.
1632 Radio France Int l: RFI Europe. See M 1231.
1634 Deutsche Welle: Living in Germany. See M 0118.
1641 Radio France Int l: Arts in France. See H 1249.
1646 Radio France Int l: Science Notes. See T 1247.

Fridays
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1631 Radio France Int l: RFI Europe. See M 1231.
1634 Deutsche Welle: Spotlight on Sport. See H 1534.
1640 Deutsche Welle: Religion and Society. See S 0137.
1640 Radio France Int l: Made in France. See H 1447.
1646 Radio France Int l: Film Reel. See F 1241.

Saturdays
1609 Deutsche Welle: International Talking Point. See S 0416.
1623 Deutsche Welle: Development Forum. Reports and interviews on projects and progress in Africa and Asia.
1624 Radio France Int l: Focus on France. See A 1425.
1631 Radio France Int l: Spotlight on Africa. See S 1215.
1645 Radio France Int l: French Lesson. See A 1247.

Your Name in Lights!

... or at least in ink within the *Monitoring Times* Shortwave Guide. Please send us your "best catches" on the worldwide shortwave bands — QSLs, that is — and we will try to use them in future issues of *MT*. Enclose SASE and your QSLs will be returned.

HAUSER'S HIGHLIGHTS: CUBA

English Language

Time	Freq
2100-2200	11720
2200-2300	6180
0100-0500	6000, 9830 (USB)
0200-0700	9820
0400-0500	6180

This is contrary to preliminary schedule published last month. Frequency clashes with Canada and South Africa at 0300-0400. 9830 USB—may be extended to 0700;
(Arnie Coro, RHC via George Thurman, Kevin Hecht, Jim Moats)

Spanish Language

1100-1300	6180, 11860
1100-1500	11760
1200-1300	9550
1200-1400	9505
2100-2300	17705, 11740, 9820-USB
0000-0200	9820, 6180
0000-0400	11970
0000-0500	11865, 11760, 9550, 9505, 6060

(RHC *En Contacto*)

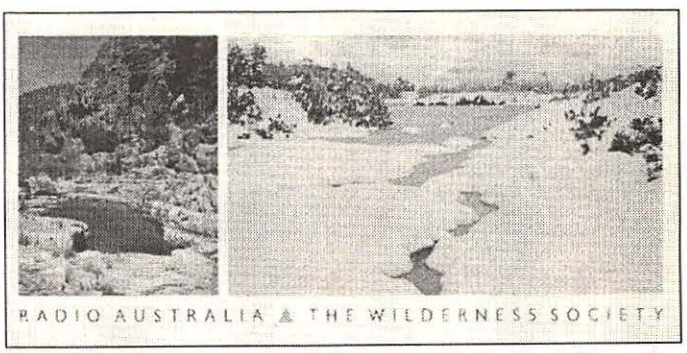
DXers Unlimited times changed to within these half-hours:
Sat 2130, 2230
Sun 0230, 0430, 0630
Tue 2130, 2230
Wed 0130, 0330, 0530
(John Norfolk, *Review of International Broadcasting*)

FREQUENCIES

1700-1715	Albania, R Tirana Intl	7155eu	9760eu		
1700-1800	Australia, ADF Radio	10375af	10429af	10458af	10650af
1700-1800	Australia, Radio	6060pa	6080pa	7260as	9580pa
		9710pa	9860pa	11660pa	11695pa
		11880pa			
1700-1800 vl	Australia, VL8A Alice Spg	2310do			
1700-1800 vl	Australia, VL8K Katherine	2485do			
1700-1800 vl	Australia, VL8T Tent Crk	2325do			
1700-1800	Azerbaijan, Voice of	7160eu			
1700-1800	Bahrain, Radio	6010do			
1700-1800 vl	Canada, CBC N Quebec Sce	9625do			
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZN St John's	6160do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, China Radio Intl	7405af	9570af	11575af	
1700-1800	Costa Rica, R Peace Intl	7385am	9400am	15030am	17905am
1700-1727	Czech Rep, Radio Prague	5930as	7345eu	9420me	
1700-1800	Ecuador, HCJB Quito	6080do	15490eu	17490pa	
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800 vl	Eqt Guinea, Radio Africa	7200af			
1700-1730	France, Radio France Intl	9485eu	11700af		
1700-1800	Iraq, Radio Iraq Intl	15250as			
1700-1800 vl	Italy, IRRS Milan	7125eu			
1700-1800	Japan, NHK/Radio	6150na	9535na	9580as	11930as
1700-1713 mtwhfa	Lebanon, Voice of	6550eu			
1700-1800	Liberia, Radio ELWA	4760do			
1700-1800 mtwhf	New Zealand, R NZ Intl	9655pa			
1700-1800	Nigeria, FRCN/Radio	3326do	4990do		
1700-1750	Pakistan, Radio	7485eu	11570eu		
1700-1800	Russia, Voice of	7115eu	7170eu	7180eu	7205eu
		7330eu	7370eu	9505eu	9530na
		9550na	9575eu	9725as	9860na
		9890eu	11825na	15385as	
1700-1800	S Africa, Channel Africa	7225af			
1700-1800 vl	Slovakia, AWR	7270as	9450as		
1700-1715	Swaziland, Trans World R	7120af			
1700-1730	Switzerland, Swiss R Intl	6205af	9885af	13635me	
1700-1720	Uganda, Radio	4976do			
1700-1800	United Kingdom,BBC London	3255af	3915as	5975as	6180eu
		6190af	6195eu	7160me	9410eu
		9515na	9630af	9740as	11750as
		11940af	12095af	15070af	15260af
		15400af	15420af	17830af	17880af
1700-1800	USA, KAIJ Dallas TX	13815am	15725am		
1700-1800	USA, KTBN Salt Lk City UT	15590am			
1700-1800	USA, KWHR Naalehu HI	7425as			
1700-1800	USA, Monitor Radio Intl	21640af			
1700-1800	USA, VOA Washington DC	6040eu	6110as	7125as	7215as
		9645as	9700eu	9760af	11920af
		12040af	13710af	15205as	15395as
		15410af	15445af	17895af	
1700-1800	USA, WCSN Scotts Cor ME	17612af			
1700-1800	USA, WEWN Birmingham AL	13615na	15695eu		
1700-1800	USA, WHRI Noblesville IN	13760am	15105am		
1700-1800	USA, WINB Red Lion PA	15715eu			
1700-1800	USA, WJCR Upton KY	7490na	13595na		
1700-1800 smtwhf	USA, WMLK Bethel PA	9465eu			
1700-1800	USA, WRNO New Orleans LA	15420am			
1700-1800	USA, WWCR Nashville TN	13845am	15685eu		
1700-1800	USA, WYFR Okeechobee FL	15566eu	17760na		
1705-1800	Ghana, Ghana Broadc Corp	3366do			
1715-1730 mtwhfa	Swaziland, Trans World R	7120af			
1715-1730	Vatican State, Vatican R	6245eu	7250eu	9645eu	
1720-1730 mtwtf	Estonia, Estonian Radio	5925eu			
1730-1800	Netherlands, Radio	6020af	9605af	11655af	
1730-1800	Romania, R Romania Intl	11830af	15340af	15365af	17805af
1730-1800	Russia, Voice of	7105eu	7340eu	9520na	9720eu
		13670af			
1730-1745	Sweden, Radio	6065eu			
1730-1800	Vatican State, Vatican R	7305af	9695af	9725af	11625af
1745-1800mtwtf	Canada, RCI Montreal	5995me	7260eu	11945eu	13650eu
		17820eu			
1745-1800	India, All India Radio	7412eu	9650me	9950me	11620eu
		11935af	13750as		

1800 UTC

1800-1900	Algiers, R Algiers Intl	11715eu			
1800-1900	Australia, ADF Radio	10375af	10429af	10458af	10650af
1800-1900	Australia, Radio	6060pa	6080pa	9580pa	9860pa
		11660as	11695pa	11880pa	
1800-1900 vl	Australia, VL8A Alice Spg	2310do			
1800-1900 vl	Australia, VL8T Tent Crk	2325do			
1800-1900	Bahrain, Radio	6010do			
1800-1900	Brazil, Radiobras	15268eu			
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZN St John's	6160do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Costa Rica, R Peace Intl	7385am	9400am	15030am	17905am
1800-1827	Czech Rep, Radio Prague	5930eu	7345eu	9420eu	
1800-1900	Ecuador, HCJB Quito	6080do	15490eu	21455eu	
1800-1830	Egypt, Radio Cairo	15255af			
1800-1900 vl	Eqt Guinea, Radio Africa	7200af			
1800-1830	Ghana, Ghana Broadc Corp	3366do	4915do		
1800-1900	India, All India Radio	7412eu	9650me	9950me	11620eu
		11935af	13750as		
1800-1900 vl	Italy, IRRS Milan	7125eu			
1800-1900	Kenya, Kenya Broadc Corp	4935do			
1800-1900	Kuwait, Radio	11990na			
1800-1900	Liberia, Radio ELWA	4760do			
1800-1830	Netherlands, Radio	6020af	9605af	11655af	
1800-1849 mtwhf	New Zealand, R NZ Intl	9655pa			
1800-1830	Nigeria, FRCN/Radio	3326do	4990do		
1800-1830 s	Norway, Radio Norway Intl	7120eu	11930af		
1800-1855	Poland, Polish R Warsaw	5995eu	7270eu	7285eu	
1800-1900	Russia, Voice of	4740as	4940eu	5995eu	6055eu
		6110me	7105na	7170na	7180as
		7205eu	7340as	7370eu	9505as
		9530eu	9550eu	9575eu	9860eu
		9880eu	9890eu	11825as	11945as
		13670af			
1800-1900 vl	Slovakia, AWR	9455af			
1800-1900 irreg	Sudan, Sudan Natl BC	9200af			
1800-1900	Swaziland, Trans World R	3200af			
1800-1845	Swaziland, Trans World R	9500af			
1800-1900	United Kingdom,BBC London	3255af	5975as	6005af	6180eu
		6190af	6195eu	7110as	9410eu
		9630af	9740me	11940af	12095af
		15070af	15400af	15420af	17830af
		17880af			
1800-1900	USA, KAIJ Dallas TX	13815am	15725am		
1800-1900	USA, KJES Mesquite NM	15385na			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, KWHR Naalehu HI	13625as			
1800-1900	USA, Monitor Radio Intl	9370eu	21640af		
1800-1900	USA, VOA Washington DC	4985af	6040eu	9700eu	9760eu
		11920af	12040af	13680af	13710af
		15580af	17800af	17895af	
1800-1900	USA, WEWN Birmingham AL	13615na	15695eu		
1800-1900	USA, WHRI Noblesville IN	9495am	13760eu		
1800-1900	USA, WINB Red Lion PA	15715eu			
1800-1900	USA, WJCR Upton KY	7490na	13595na		
1800-1900	USA, WMLK Bethel PA	9465eu			
1800-1900	USA, WRNO New Orleans LA	15420am			
1800-1900	USA, WWCR Nashville TN	13845am	15685am	17525am	
1800-1845	USA, WYFR Okeechobee FL	15566eu			
1800-1900	USA, WYFR Okeechobee FL	17760na			
1800-1900	Yemen, Yemeni Rep Radio	9780do			
1815-1900	Bangladesh, Radio	7190eu	9647eu		
1830-1855	Moldova, R Moldova Intl	7235eu			
1830-1900	Netherlands, Radio	6015af	6020af	9605af	9860af
		9895af	15315af	17605af	
1830-1845	Rwanda, Radio	6055do			
1830-1900	Sweden, Radio	6065eu	9655af	13690me	
1840-1850 mtwhfa	Greece, Voice of	15650af	17525af		
1845-1900	Armenia, Radio Yerevan	4810eu	4990eu	5930eu	6065eu
1845-1900 irreg s	Mali, RDTV Malienne	4783do	4835do	5995do	
1850-1900	New Zealand, R NZ Intl	11735pa			



Yes, Donald Choleva scored this Radio Australia QSL, too!

FREQUENCIES

1900-1930	Albania, R Tirana Intl	7230eu	9730eu		
1900-2000 mtwhf	Argentina, RAE	15345eu			
1900-2000	Australia, Radio	6060pa	6080pa	6150as	7240pa
	7260as 9560as	9580pa	9860pa	11660pa	11695pa
	11880pa				
1900-2000 vl	Australia, VL8A Alice Spg	2310do			
1900-2000 vl	Australia, VL8K Katherine	2485do			
1900-2000 vl	Australia, VL8T Tent Crk	2325do			
1900-2000	Bahrain, Radio	6010do			
1900-1945	Bangladesh, Radio	7190as	9647do		
1900-1930	Belgium, R Vlaanderen Int	5910eu	9925af		
1900-1918	Brazil, Radiobras	15268eu			
1900-2000	Bulgaria, Radio	7305eu	9700eu		
1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZN St John's	6160do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000	China, China Radio Intl	9440af	11515af		
1900-2000	Costa Rica, R Peace Intl	7385am	9400am	15030am	17905am
1900-2000	Ecuador, HCJB Quito	6080do	15490eu	17490eu	21455eu
1900-2000 vl	Eqt Guinea, Radio Africa	7200af			
1900-1950	Germany, Deutsche Welle	7110af	9665af	9765af	11785af
	11810af 11865af	13790af	15145af	15425af	
1900-1910 mtwhfa	Greece, Voice of	7450eu	9380eu		
1900-1945	India, All India Radio	7412eu	9650me	9950me	11620eu
		11935af	13750as		
1900-2000 vl	Italy, IRRS Milan	7125eu			
1900-2000	Japan, NHK/Radio	6150as	7140au	9535na	9580au
		11850au			
1900-2000	Kenya, Kenya Broadc Corp	4935do			
1900-2000	Kuwait, Radio	11990eu			
1900-2000	Liberia, Radio ELWA	4760do			
1900-1925	Netherlands, Radio	6015af	6020af	9605af	9860af
		9895af	15315af	17605af	
1900-2000	New Zealand, R NZ Intl	11735pa			
1900-2000	Nigeria, FRCN/Voice of	7255af			
1900-1930 s	Norway, Radio Norway Intl	5960eu	7215pa	9590af	
1900-2000 vl	Papua New Guinea, NBC	4890do			
1900-2000	Romania, R Romania Intl	9690eu	9750eu	11810eu	11940eu
1900-2000	Russia, Voice of	4740as	5995eu	6005as	6055eu
	6110eu 7150eu	7170eu	7180na	7205eu	7210eu
	7275eu 7340as	7400as	9505eu	9530af	9550eu
	9575eu 9800na	9860as	9890eu	11825as	11945eu
	13670eu 15205af				
1900-1915	Rwanda, Radio	6055af			
1900-2000 vl	Slovakia, AWR	9455as			
1900-2000	South Korea, R Korea Intl	5975as			
1900-2000	Spain, R Exterior Espana	11775af			
1900-2000	Swaziland, Trans World R	3200af	3240af		
1900-2000	Thailand, Radio	9655eu	9700eu	11855eu	11905eu
1900-1915	Uganda, Radio	4976do	5026do		
1900-2000	United Kingdom,BBC London	3255af	6180eu	6195eu	7110as
	7160me 9410eu	9630af	9740me	11955as	12095af
	15070af 15400af	17830af	17880af		
1900-2000	USA, KAIJ Dallas TX	13815am	15725am		
1900-2000	USA, KTBN Salt Lk City UT	15590am			
1900-2000 as	USA, KVOH Los Angeles CA	17775am			
1900-2000	USA, KWHR Naalehu HI	13625as			
1900-2000	USA, Monitor Radio Intl	9370eu	17510af		
1900-2000	USA, VOA Washington DC	3980eu	6040eu	7415af	9525pa
	9700af 9760af	11870as	11920af	12040af	13710af
	15180pa 15410af	15445af	15580af	17800af	
1900-2000	USA, WCSN Scotts Cor ME	17612af			
1900-2000	USA, WEWN Birmingham AL	13615na	15695eu	18930sa	
1900-2000	USA, WHRI Noblesville IN	9495am	13760eu		
1900-2000	USA, WINB Red Lion PA	11915eu			
1900-2000	USA, WJCR Upton KY	7490na	13595na		
1900-2000	USA, WMLK Bethel PA	9465eu			
1900-2000 a	USA, WRMI/R Miami Intl	9955am			
1900-2000	USA, WRNO New Orleans LA	15420am			
1900-2000	USA, WWCR Nashville TN	12160eu	13845am	15685am	17525am
1900-2000	USA, WYFR Okeechobee FL	17760af			
1910-1920	Botswana, Radio	3356af	4830af	7255af	
1930-2000	Austria, R Austria Intl	5945eu	6155eu	9880me	13730af
1930-2000	Finland, YLE/Radio	6120eu	9730eu	11755eu	
1930-2000	Iran, VOIRI Tehran	9022me	11790me		
1930-2000	Netherlands, Radio	6020af	9605af	9860af	9895af
		11655af	15315af	17605af	
1930-2000	Serbia, Radio Yugoslavia	6100eu	9720eu		
1930-2000	Slovakia, R Slovakia Intl	5915eu	7345eu		
1930-2000	South Korea, R Korea Intl	7250eu			
1930-2000 a	Uganda, Radio	4976do	5026do		
1930-2000 s	USA, WRMI/R Miami Intl	9955am			
1935-1955	Italy, RAI Rome	7275eu	9575eu	11905eu	
1940-2000	Mongolia, R Ulan Bator	7295na	13650na		
1945-2000 t	Belarus, Belarussian R	5940eu	7105eu	7210eu	7405eu

2000-2100	Australia, Radio	6060pa	6080pa	6150pa	7260as
		9580pa	9860pa	11660pa	11695pa
		11855as	11880pa		
2000-2100 vl	Australia, VL8A Alice Spg	2310do			
2000-2100 vl	Australia, VL8K Katherine	2485do			
2000-2100 vl	Australia, VL8T Tent Crk	2325do			
2000-2100	Bahrain, Radio	6010do			
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZN St John's	6160do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	China, China Radio Intl	9440af	9920eu	11500eu	11715af
		15110af			
2000-2100	Costa Rica, R Peace Intl	7385am	9400am	15030am	17905am
2000-2100	Ecuador, HCJB Quito	6080do	17490eu		
2000-2100 vl	Eqt Guinea, Radio Africa	7200af			
2000-2050	Germany, Deutsche Welle	5960eu	7285eu		
2000-2030	Ghana, Ghana Broadc Corp	3366do	4915do		
2000-2030	Hungary, Radio Budapest	3975eu	6110eu	7220eu	
2000-2100	Indonesia, Voice of	9675as	11752as		
2000-2030	Israel, Kol Israel	7405na	7465na	9435eu	11603na
		17575af			
2000-2100 vl	Italy, IRRS Milan	7125eu			
2000-2100	Kenya, Kenya Broadc Corp	4935do			
2000-2100	Kuwait, Radio	11990eu			
2000-2100	Liberia, Radio ELWA	4760do			
2000-2030	Lithuania, Radio Vilnius	9710eu			
2000-2010	Mongolia, R Ulan Bator	7295eu	13650eu		
2000-2025	Netherlands, Radio	6020af	9605af	9860af	9895af
		11655af	15315af	17605af	
2000-2050	New Zealand, R NZ Intl	11735pa			
2000-2005	Nigeria, FRCN/Radio	3326do	4990do		
2000-2100	Nigeria, FRCN/Voice of	7255af			
2000-2100 vl	Papua New Guinea, NBC	4890do			
2000-2030 mtwhf	Portugal, Radio	21515af	21655af		
2000-2100	Russia, Voice of	4055eu	4860eu	5920eu	5995eu
	6055eu 6085eu	6110eu	7170eu	7205eu	7215eu
	7400eu 7420na	9490na	9515eu	9530eu	9550eu
	9800na 9860na	9875na	9890na	11675as	11750na
	12015na 13670as	15205eu	15385na		
2000-2100 vl	Slovakia, AWR	6055eu	9455af		
2000-2100 vl	Solomon Islands, SIBC	5020do	9545do		
2000-2045 s	Swaziland, Trans World R	3240af			
2000-2030	Switzerland, Swiss R Intl	3985eu	6135af	6165eu	9770af
		9885af	11640af	13635af	
2000-2002	Uganda, Radio	4976do	5026do		
2000-2030	United Kingdom,BBC London	7160me	9630af	9740me	17830af
2000-2100	United Kingdom,BBC London	3255af	6180eu	6195eu	7110as
		7325eu	9410eu	11750am	12095af
		15070af	15260sa	15400af	17880af
2000-2100	USA, KAIJ Dallas TX	13815am	15725am		
2000-2100 vl	USA, KJES Mesquite NM	15385na			
2000-2100	USA, KTBN Salt Lk City UT	15590am			
2000-2100 as	USA, KVOH Los Angeles CA	17775am			
2000-2100	USA, KWHR Naalehu HI	11980as			
2000-2100	USA, Monitor Radio Intl	7510eu	7535eu	9370eu	
2000-2100	USA, VOA Washington DC	3980eu	6040eu	7415af	9495eu
	9700eu 9760af	13710af	15160af	15205me	15410af
	15445af 15580af	17800af	21485af		
2000-2100	USA, WEWN Birmingham AL	13615na			
2000-2100	USA, WHRI Noblesville IN	9495am	13760eu		
2000-2100	USA, WINB Red Lion PA	11915eu			
2000-2100	USA, WJCR Upton KY	7490na	13595na		
2000-2100	USA, WMLK Bethel PA	9465eu			
2000-2100	USA, WRNO New Orleans LA	15420am			
2000-2100	USA, WWCR Nashville TN	12160eu	13845am	15685am	17525eu
2000-2045	USA, WYFR Okeechobee FL	21525af			
2000-2100	USA, WYFR Okeechobee FL	13695af			
2000-2030	Vatican State, Vatican R	7355af	9645af	11625af	
2005-2100	Syria, Radio Damascus	12085eu	15095na		
2015-2045 s	Swaziland, Trans World R	3200af			
2025-2045	Italy, RAI Rome	7235me	9710me	11800me	
2030-2100	Egypt, Radio Cairo	15375af			
2030-2100	Netherlands, Radio	9860af	9895af		
2030-2100 mtwhfa	Palau, KHBN/Voice of Hope	11980as			
2030-2100	Poland, Polish R Warsaw	5995eu	6135eu	7285eu	
2030-2100	Russia, Voice of	6185as	7180eu	7260eu	9520eu
		9550eu			
2030-2045	Thailand, Radio	9655eu	9700eu	11905eu	
2030-2100	Vietnam, Voice of	10059as	12025as	15010as	
2045-2100	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15225pa		
2050-2100	Vatican State, Vatican R	3945eu	5882eu		
2051-2100	New Zealand, R NZ Intl	15115p			

RAMSEY America's #1 Source For Hobby Kits

TONE GRABBER

Grab Touch-Tone numbers right off the air, phone or tape. A simple hook-up to any radio speaker or phone line is all that is required to instantly decipher touch-tone phone numbers or codes. A 256 digit memory stores decoded numbers and keeps its memory even in the event of power loss. An 8 digit LED display allows you to scroll through the memory bank to examine numbers. To make it easy to pick out number groups or codes, a "dash" is inserted between sets of digits that were decoded more than 2 seconds apart. A "central-office" quality crystal controlled decoder is used allowing rapid and reliable detection of numbers at up to 20 digits per second! For a professionally finished look, add our matching case set. Start cracking those secret codes tomorrow with the Tone Grabber!

TG-1 Tone Grabber kit	$99.95
CTG Matching case set	$14.95
TG-1WT Fully assembled TG-1 and case	$149.95

FM RECEIVER/TRANSMITTER

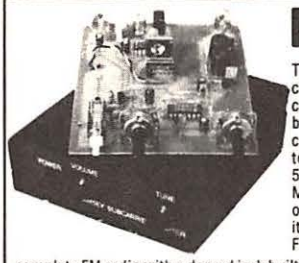
Keep an ear on the local repeater, police, weather or just tune around. These sensitive superhet receivers are fun to build and use. Tunes any 5 MHz portion of the band and have smooth varactor tuning with AFC, dual conversion, ceramic filtering, squelch and plenty of speaker volume. Complete manual details how the rigs work and applications. 2M FM transmitter has 5W RF out, crystal control (146.52 included), pro-specs and data/mike inputs. Add our case sets for a nice finish.

FM Receiver kit	$34.95
Specify band: FR-146 (2M), FR-6 (6M), FR-10 (10M), FR-220 (220MHz)	
CFR Matching case set	$14.95
FT-146 Two Meter FM trans kit	$79.95

SCRAMBLER/DESCRAMBLER

Descramble most scramble systems heard on your scanner radio or set up your own scrambled communication system over the phone or radio. Latest 3rd generation IC is used for fantastic audio quality-equivalent to over 30 op-amps and mixers! Crystal controlled for crystal clear sound with a built-in 2 watt audio amp for direct radio hook-up. For scramble systems, each user has a unit for full duplex operation. Communicate in privacy with the SS-70. Add our case set for a fine professional finish.

SS-70 Scrambler/Descrambler kit	$39.95
CSSD Matching case set	$14.95
SS-70WT Fully assembled SS-70 and case set	$79.95



SCA DECODER

Tap into the world of commercial-free music and data that is carried over many standard FM broadcast radio stations. Decoder hooks to the demodulator of FM radio and tunes the 50-100 kHz SCA subcarrier band. Many radios have a demod output, but if your radio doesn't, it's easy to locate, or use our FR-1 FM receiver kit which is a complete FM radio with a demod jack built-in. These "hidden" subcarriers carry lots of neat programming-from stock quotes to news to music, from rock to easy listening-all commercial free. Hear what you have been missing with the SCA-1.

SCA-1 Decoder kit	$27.95
CSCA Matching case set	$14.95
FR-1 FM receiver kit	$24.95
CRR Matching case for FR-1	$14.95

SCANNER CONVERTER

Tune in on the 800-950 MHz action using your existing scanner. Frequencies are converted with crystal referenced stability to the 400-550 MHz range. Instructions are even included on building high performance 900 MHz antennas. Well designed circuit features extensive filtering and convenient on-off/bypass switch. Easy one hour assembly or available fully assembled. Add our matching case set for a professional look.

SCN-1 Scanner converter kit	$49.95
CSCN Matching case set	$14.95
SCN-1WT Assembled SCN-1 and case	$89.95

FULLY WIRED & TESTED

DSP FILTER

What is DSP? DSP allows the "construction" of various filters of great complexity by using computer code. This allows us to have easy access to a variety of filters, each perfectly optimized for whatever mode we are operating. The DSP II has been designed to operate in 10 different modes. Four filters are optimized for reducing interference to SSB phone signals from CW, heterodynes and random noise interference. Four more filters operate as "brick-wall" CW bandpass filters. the remaining two filters are designed for reliable recovery of RTTY and HF packet radio information signals. A single front panel switch selects any of these filters. Easy hookup to rigs speaker jack.

W9GR DSP Filter	$299.95
12V DC Power Supply	$11.95

BROADBAND PREAMP

Ever wish you could "perk up" your counter to read really weak signals? Or, how about boosting that cable TV signal to drive sets throughout the house, or maybe preamping the TV antenna to pull in that blacked out football game. And, if you're into small broadcasting, boost your transmitter power up to 100 mW! The PR-2 broadband preamp is the answer to all those needs as well as many others. You can use the PR-2 anywhere a high gain, low noise, high power amp is called for: digging out those weak shortwave signals or putting new life into that scanner radio-especially at 800 MHz. The PR-2 has a high power compression point, meaning that it does not overload easily-in fact many folks use it for boosting the power on their FM-10A stereo transmitters. Newly designed microwave MMIC chips from NEC in Japan enable the PR-2 to have gain all the way up to 2 GHz, although we only spec it to 1 GHz-believe it or not, the connector lead length is the limiting factor! Customers tell us the PR-2 outperforms professional lab units by the "big boys" that go for hundreds more. The PR-2 is the ideal general purpose amp you'll wonder how you got along without.

PR-2 Specifications: Gain: 25dB, Noise Figure: 2.5 dB, Input/Output Impedance: 50-75 ohms, Compression point: +18 dBm

PR-2 Broadband Preamp, Fully Wired and Tested $59.95

STEREO TRANSMITTER

Run your own Stereo FM radio station! Transmits a stable signal in the 88-108 MHz FM broadcast band up to 1 mile. Detailed manual provides helpful info on FCC regs, antenna ideas and range to expect. Latest design features adjustable line level inputs, pre-emphasis and crystal controlled subcarrier. Connects to any CD or tape player, mike mixer or radio. Includes free tuning tool too! For a pro look add our matching case set with on-board whip antenna.

FM-10A Stereo transmitter kit	$34.95
CFM Case, whip ant set	$14.95

ACTIVE ANTENNA

Cramped for space? Get longwire performance with this desktop antenna. Properly designed unit has dual HF and VHF circuitry and built-in whip antenna, as well as external jack. RF gain control and 9V operation makes unit ideal for SWLs, traveling hams or scanner buffs who need hotter reception. The matching case and knob set gives the unit a hundred dollar look!

AA-7 Kit	$28.95
CAA Matching case & knobset	$14.95

AIRCRAFT RECEIVER

Tune into the exciting world of aviation. Listen to the airlines, big business corporate jets, hot-shot military pilots, local private pilots, control towers, approach and departure radar control and other interesting and fascinating air-band communications. You'll hear planes up to a hundred miles away as well as all local traffic. The AR-1 features smooth varactor tuning of the entire air band from 118 to 136 MHz, effective AGC, superheterodyne circuitry, squelch, convenient 9 volt operations and plenty of speaker volume. Don't forget to add our matching case and knob set for a fine looking project you'll love to show. Our detailed instruction manual makes the AR-1 an ideal introduction to two life-long, fascinating hobbies at once-electronics and aviation! See *Kit Planes* magazine (January 1991) or *Popular Electronics* (January 1993) for excellent product reviews of the AR-1.

AR-1 Aircraft Receiver Kit	$29.95
C-AR Case and Knobset for AR-1	$14.95

INTERCEPTOR

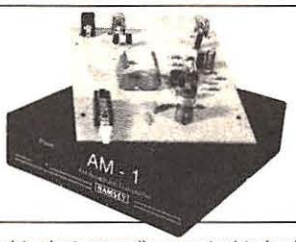
The Interceptor will lock on instantly to the nearest transmitter and allow you to listen with perfect audio quality. Since the Interceptor does not have to search through all frequencies, those quick transmissions that are hopelessly lost on scanners are captured easily. The Interceptor does not need tuning, making it ideal for hands-free surreptitious monitoring of nearby transmissions. The Interceptor is complete self-contained with internal speaker and earphone jack for private listening. Included are: Nicad battery pack, AC/adaptor charger, antenna and earphone. Increase your security and awareness-intercept the communications around you with the Interceptor. Fully wired with 1 year warranty. Covers 30-2000 MHz frequency range, FM deviations from 5 kHz to 200 kHz.

R10 Interceptor,
Fully Wired 1 year warranty $349.95

AM BROADCAST TRANSMITTER

High quality, true AM broadcast band transmitter is designed exactly like the big commercial rigs. Power of 100 mW, legal range of up to 1/4 mile. Accepts line level inputs from tape and CD players and mike mixers, tunable 550-1750 kHz. Complete manual explains circuitry, help with FCC regs and even antenna ideas. Be your own Rush Limbaugh or Rick Dees with the AM-1! Add our case set for a true station look.

AM-1 Transmitter kit	$29.95
CAM Matching case set	$14.95



FOXHOUND DIRECTION FINDER

Locate hidden or unknown transmitters fast. The Foxhound direction finder connects to theantenna and speaker jack on any radio receiver, AM or FM from 1 MHz to 1 GHz. The antenna (a pair of dipole telescopic whips) is rotated until the Null meter shows a minimum. A pair of LEDs indicate to turn Left or Right. The Foxhound is ideal to use with a walkie-talkie, if you wish to transmit, go ahead, a build-in T/R switch senses any transmitted RF and switches itself out of circuit while you talk. It doesn't get any easier than this! We provide all parts except for a few feet of 1/2 inch PVC pipe available at any hardware store for a dollar or two. Add our matching case set for a complete finished unit. Be the one with the answers, win those transmitter hunts and track down those jammers, you'll do it all with your Foxhound.

DF-1 Foxhound direction finder kit	$59.95
CDF Matching case set for DF-1	$14.95
FHT-1 SlyFox Foxhunt transmitter kit	$129.95
FHID-1 Voice ID option	$29.95
CFHT Heavy duty metal case set for FHT-1	$29.95

SHORTWAVE CONVERTER

The SC-1 converter brings the sounds of the world right into your car radio or home stereo (set to AM broadcast band). Front panel push switches let you choose easily between regular AM radio and the shortwave bands. An additional switch allows the selection of any two bands of interest, each 1 MHz wide. Set one range for daytime frequencies and one for nighttime when propagation is different, choose any two frequencies between 3 and 22 MHz. Frequencies are tuned on your AM radio, making it easy to log stations or set presets. A built-in antenna switch automatically switches the existing AM antenna to either the radio or converter, making hook-up easy and fast. As with many of our kits, a handsome matching case and knob set is available to put the finishing touches on your kit.

SC-1 Shortwave Converter Kit	$27.95
CSC Matching Case and Knob Set	$14.95

SHORTWAVE RECEIVER

Here's a complete shortwave radio guaranteed to inspire awe in any listener. Imagine tuning in the BBC, Radio Moscow, Radio Baghdad and other services with just a couple of feet of antenna. This very sensitive (about a microvolt!) receiver is a true superhet design with AGC, RF gain control and plenty of speaker volume. Smooth varactor diode tuning allows you to tune any 2 MHz portion of the 4 to 11 MHz frequency range, and the kit conveniently runs on a 9 volt battery. Add our matching custom case and knob set to give your radio a finished, polished, look. Amaze yourself-and others-see how you can listen to the world on a receiver you built in an evening.

SR-1 Shortwave Radio Kit	$29.95
CSR Case and Knob Set	$14.95

ORDERS ONLY CALL 1-800-446-2295

(No tech info at this number)

TECH/ORDER/INFO 716-924-4560 FAX 716-924-4555

TERMS: Satisfaction guaranteed. Examine for 10 days. If not pleased return it in original form for refund. Add $4.95 for shipping, handling and insurance. For foreign orders add 20% for surface mail. COD (U.S. only) add $5.00. Orders under $20 add $3.00 NY residents add 7% sales tax. 90-day parts warranty on kit parts. 1-year parts and labor warranty on wired units

RAMSEY ELECTRONICS, INC.
793 CANNING PARKWAY, VICTOR NY 14564

FREQUENCIES

2100-2200	Australia, Radio	6060pa	6080pa	7240pa	7260as
		11855as	11880pa	11955pa	
2100-2130 vl	Australia, VL8A Alice Spg	2310do			
2100-2130 vl	Australia, VL8K Katherine	2485do			
2100-2130 vl	Australia, VL8T Tent Crk	2325do			
2100-2115	Bahrain, Radio	6010do			
2100-2200 vl	Canada, CBC N Quebec Sce	9625do			
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZN St John's	6160do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2130	Canada, RCI Montreal	5995eu	7260eu	11945eu	13650eu
		13690eu	15140eu	15325eu	17820eu
2100-2200	China, China Radio Intl	9920eu	11500eu		
2100-2130	China, China Radio Intl	11715af	15110af		
2100-2200	Costa Rica, R Peace Intl	7385am	9400am	15030am	17905am
2100-2200	Cuba, Radio Havana Cuba	11720eu			
2100-2127	Czech Rep, Radio Prague	5930eu	7345eu	9420eu	
2100-2200	Egypt, Radio Cairo	15375af			
2100-2130 mt	Estonia, Estonian Radio	5925eu			
2100-2150	Germany, Deutsche Welle	6185as	7225af	9615af	9670as
		9690af	9765as	11785as	11810af
		15270af			
2100-2200 vl	Italy, IRRS Milan	7125eu			
2100-2200	Japan, NHK/Radio	6035eu	9560as	9580af	11800eu
		11925eu			
2100-2115	Japan, NHK/Radio	9660as	11915as		
2100-2110	Kenya, Kenya Broadc Corp	4935do			
2100-2200	Lebanon, Wings of Hope	9960me			
2100-2200	Liberia, Radio ELWA	4760do			
2100-2125	Netherlands, Radio	9860af	9895af		
2100-2200	New Zealand, R NZ Intl	15115pa			
2100-2200	Nigeria, FRCN/Radio	3326do	4990do		
2100-2200 mtwhfa	Palau, KHBN/Voice of Hope	11980as			
2100-2200 vl	Papua New Guinea, NBC	4890do	9675do		
2100-2125	Poland, Polish R Warsaw	5995eu	6135eu	7285eu	
2100-2200	Romania, R Romania Intl	5990eu	7225eu	9690eu	9750eu
		11940eu			
2100-2200	Russia, Voice of	4055as	5905eu	5920eu	5965eu
	5975eu 5995eu	6055eu	7150na	7170eu	7180na
	7205na 7230eu	7300eu	7320eu	7330as	7350as
	7380eu 7400eu	9550eu	9620as	9750eu	9795na
	9890eu 13670na	15290na	15580na		
2100-2150	S Africa, Channel Africa	5960eu	7285eu		
2100-2115	Sierra Leone, SLBS	3316do			
2100-2200 vl	Slovakia, AWR	6055eu	7270af		
2100-2200 vl	Solomon Islands, SIBC	5020do	9545do		
2100-2200	South Korea, R Korea Intl	6480eu	15575eu		
2100-2200	Spain, R Exterior Espana	6125eu			
2100-2105	Syria, Radio Damascus	12085eu	15095na		
2100-2200	Turkey, Voice of	9400eu			
2100-2105	Uganda, Radio	4976do	5026do		
2100-2200	United Kingdom,BBC London	3255af	3915as	5975na	6005af
	6180eu 6195eu	7110as	7325eu	9410eu	11750sa
	11955as 12095af	15070eu	15260as	15360as	15400na
	15575eu				
2100-2200	USA, KAIJ Dallas TX	13815am	15725am		
2100-2200	USA, KTBN Salt Lk City UT	15590na			
2100-2200 s	USA, KVOH Los Angeles CA	17775am			
2100-2200	USA, KWHR Naalehu HI	11980as			
2100-2200	USA, Monitor Radio Intl	7510eu	7535na	9370eu	
2100-2200	USA, VOA Washington DC	6040eu	6125eu	7415af	9760eu
	11870pa 13710af	15185pa	15205me	15410af	15445af
	15580af 17735pa	17800af	21485af		
2100-2200	USA, WEWN Birmingham AL	13615na	18930sa		
2100-2200	USA, WHRI Noblesville IN	9495am	13760am		
2100-2200	USA, WINB Red Lion PA	11915eu			
2100-2200	USA, WJCR Upton KY	7490na	13595na		
2100-2200	USA, WMLK Bethel PA	9465na			
2100-2200	USA, WRNO New Orleans LA	15420am			
2100-2200	USA, WWCR Nashville TN	12160eu	13845am	15685am	
2100-2200	USA, WYFR Okeechobee FL	7355eu	11580af	13695af	
2110-2200	Syria, Radio Damascus	12085na	15095na		
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130 mtwhf	United Kingdom,BBC Carib	6110am	15390am	17715am	
2130-2200	Australia, Radio	9580pa	9610as	9645as	9660pa
		11695pa	15365pa	17860pa	
2130-2200 vl	Australia, VL8A Alice Spg	4835do			
2130-2200 vl	Australia, VL8K Katherine	5025do			
2130-2200 vl	Australia, VL8T Tent Crk	4910do			
2130-2200 as	Latvia, Radio	5935eu			
2130-2200 asmtwh	Moldova, R Dnestr Intl	9620eu			
2130-2200	Sweden, Radio	6065eu	9655eu		
2200-2300	Australia, Radio	9580pa	9610as	9645as	9660pa
		11695pa	11855as	11880pa	11955pa
		13755as	15365pa	17795pa	17860pa
2200-2300 vl	Australia, VL8A Alice Spg	4835do			
2200-2300 vl	Australia, VL8K Katherine	5025do			
2200-2300 vl	Australia, VL8T Tent Crk	4910do			
2200-2230	Belgium, R Vlaanderen Int	5910eu	6030eu		
2200-2300	Bulgaria, Radio	7105eu	9700eu		
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZN St John's	6160do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230	Canada, RCI Montreal	5995eu	7260eu	11705as	11945eu
		13650eu	13690eu	15140eu	15325eu
		17820eu			
2200-2230	China, China Radio Intl	3985eu			
2200-2300	China, China Radio Intl	7170eu			
2200-2300	Costa Rica, R Peace Intl	7385am	9400am	15030am	17905am
2200-2300	Cuba, Radio Havana Cuba	6180na			
2200-2227	Czech Rep, Radio Prague	5930eu	7345af	9420eu	
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300 vl	Eqt Guinea, Radio Africa	15190af			
2200-2230	Hungary, Radio Budapest	3955eu	6110eu	7220eu	
2200-2230	Iran, VOIRI Tehran	11790me			
2200-2300 vl	Italy, IRRS Milan	7125eu			
2200-2225	Italy, RAI Rome	9710as	11800as	15330as	
2200-2300	Lebanon, Wings of Hope	9960me			
2200-2300	Malaysia, Radio	7295do			
2200-2300	Malaysia, RTM/Kota Kinaba	5980do			
2200-2300	New Zealand, R NZ Intl	15115pa			
2200-2205	Nigeria, FRCN/Radio	3326do	4990do		
2200-2300 mtwhfa	Palau, KHBN/Voice of Hope	11980as			
2200-2300 vl	Papua New Guinea, NBC	9675do			
2200-2300	Russia, Voice of	5920eu	5965eu	5975na	5995eu
		6055eu	7150na	7180eu	7300eu
		7320eu	7330eu	7350eu	7380as
		7400na	9550eu	9620na	9750na
		9890as			
2200-2230	Serbia, Radio Yugoslavia	6185eu	9720eu		
2200-2215	Sierra Leone, SLBS	3316do			
2200-2300 vl	Slovakia, AWR	7270af			
2200-2235 vl	Solomon Islands, SIBC	5020do	9545do		
2200-2205	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	5810eu	9850eu		
2200-2300	UAE, Radio Abu Dhabi	9605na	9770na	11885na	
2200-2300	Ukraine, R Ukraine Intl	4820eu	5940eu	6020eu	6055eu
		7180eu	7240eu	9620as	9810eu
		11870eu			
2200-2300	United Kingdom,BBC London	3915as	3955eu	5975na	6195eu
		7180as	7325eu	9410eu	9570as
		9590na	9915am	11695as	11750sa
		11955as	12095af	15070eu	15260sa
		15400af	15575eu		
2200-2300	USA, KAIJ Dallas TX	13815am	15725am		
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2300	USA, KWHR Naalehu HI	17510as			
2200-2300	USA, Monitor Radio Intl	7510eu	13770na		
2200-2300	USA, VOA Washington DC	6035as	7215as	9705as	9770as
		9890as	11760as	15185au	15290as
		15305as	17735as	17820as	
2200-2300	USA, WEWN Birmingham AL	7425na			
2200-2300	USA, WHRI Noblesville IN	7315na			
2200-2300	USA, WINB Red Lion PA	11915eu			
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300	USA, WRNO New Orleans LA	15420am			
2200-2300 vl	USA, WWCR Nashville TN	12160am	13845am	15685am	
2200-2245	USA, WYFR Okeechobee FL	11580af	13695af		
2230-2300	Belgium, R Vlaanderen Int	9935sa			
2230-2300 mtwhf	Canada, RCI Montreal	5960na	9755na	13650am	13670am
2230-2300	Israel, Kol Israel	7405na	7465eu	9435sa	11603na
		15640sa	15650sa		
2230-2300	Lithuania, Radio Vilnius	9710eu			
2230-2300	Sweden, Radio	6065eu			
2230-2300 a	USA, WRMI/R Miami Intl	9955am			
2240-2250 smtwhf	Greece, Voice of	9375au	9425au		
2245-2300	Ghana, Ghana Broadc Corp	3366do	4915do		
2245-2300	India, All India Radio	9705as	9950as	11745as	15145as
2245-2300 mtwhf	USA, Voice of the OAS	9670na	11835na	15155na	

FREQUENCIES

2245-2300	Vatican State, Vatican R	6150as	7305as	9600au	11830pa
2300-2315	Armenia, Radio Yerevan	9480eu	11960eu		
2300-0000	Australia, Radio	9580pa	9610as	9645as	9660pa
		9850as	11695as	11855as	13755as
		15365pa	17795pa	17860pa	
2300-0000 vl	Australia, VL8A Alice Spg	4835do			
2300-0000 vl	Australia, VL8K Katherine	5025do			
2300-0000 vl	Australia, VL8T Tent Crk	4910do			
2300-0000 vl	Canada, CBC N Quebec Sce	9625do			
2300-0000	Canada, CFCX Montreal	6005do			
2300-0000	Canada, CFRX Toronto	6070do			
2300-0000	Canada, CFVP Calgary	6030do			
2300-0000	Canada, CHNX Halifax	6130do			
2300-0000	Canada, CKZN St John's	6160do			
2300-0000	Canada, CKZU Vancouver	6160do			
2300-2330 mtwhf	Canada, RCI Montreal	5960na	9755na		
2300-2330 mtwtf	Canada, RCI Montreal	5960na	9535am	9755na	11845na
		11940am			
2300-0000 as	Canada, RCI Montreal	5960na	9535am	9755na	11845na
		11940am			
2300-0000	Costa Rica, R Peace Intl	7385am	9400am	15030am	17905am
2300-0000	Ecuador, HCJB Quito	6080do			
2300-0000	Egypt, Radio Cairo	9900na			
2300-0000	Guam, KSDA/AWR	11980as			
2300-0000 vl	Guatemala, AWR	5980ca			
2300-0000	India, All India Radio	9705as	9950as	11745as	13750as
		15145as			
2300-0000 vl	Italy, IRRS Milan	7125eu			
2300-0000	Japan, NHK/Radio	6055eu	6155eu	9560as	9580as
2300-0000	Lebanon, Wings of Hope	9960me			
2300-0000	Malaysia, Radio	7295do			
2300-0000	Malaysia, RTM/Kota Kinaba	5980do			
2300-0000	New Zealand, R NZ Intl	15115pa			
2300-2305	Nigeria, FRCN/Radio	3326do	4990do		
2300-2350	North Korea, R Pyongyang	11700na	13650na		
2300-0000 mtwhfa	Palau, KHBN/Voice of Hope	11980as			
2300-0000 vl	Papua New Guinea, NBC	9675do			
2300-0000	Russia, Voice of	9620na	9685na	9750na	12065na
		15425na	17570as	17890as	
2300-0000	Turkey, Voice of	7185me	9445na	11710eu	
2300-0000	UAE, Radio Abu Dhabi	9605na	9770na	13605na	
2300-0000	United Kingdom,BBC London	5975na	6175na	6195eu	9570as
		9590na	9915am	11750sa	11945as
		11955as	15260sa	15370as	
2300-0000	USA, KAIJ Dallas TX	13740am	13815am		
2300-0000	USA, KTBN Salt Lk City UT	15590na			
2300-0000	USA, Monitor Radio Intl	7510eu	13770sa		
2300-0000	USA, VOA Washington DC	6035as	7215as	9705as	9770as
		9890as	11760as	15185au	15290as
		15305as	17735as	17820as	
2300-0000	USA, WCSN Scotts Cor ME	9855eu			
2300-0000	USA, WEWN Birmingham AL	7425na	11820sa		
2300-0000	USA, WHRI Noblesville IN	7315am			
2300-0000	USA, WINB Red Lion PA	11915eu			
2300-0000	USA, WJCR Upton KY	7490na	13595na		
2300-2330 a	USA, WRMI/R Miami Intl	9955am			
2300-0000 mtwtf	USA, WRMI/R Miami Intl	9955am			
2300-0000 vl	USA, WWCR Nashville TN	5065am	13845am		
2330-2345	Armenia, Radio Yerevan	9685na	11920na	11970na	
2330-0000	Austria, R Austria Intl	9870sa	13730sa		
2330-0000	Finland, YLE/Radio	5990na	6015na	9680as	
2330-0000	Netherlands, Radio	6020na	6165na		
2330-0000	Sweden, Radio	11910as			
2330-0000	Vietnam, Voice of	12025as	15010as		
2330-000mtwtf	Canada, RCI	5960na	9755na		
2335-2345 smtwhf	Greece, Voice of	9425sa	11595sa	11645sa	

SELECTED PROGRAMS

Sundays

2310 Radio Japan: Hello from Tokyo. See S 0310.
2330 Radio Canada Int'l: The Mailbag. See S 1437.
2330 Radio Finland: Compass North. World and Finnish news, commentary and background reports.
2336 Radio Netherlands (na): They're Playing My Song. Reminiscencing about songs which had meaning to RN's producers.
2350 Radio Japan: Viewpoint. See S 0350.
2353 Radio Netherlands (na): EuroQuest. An audio magazine with correspondents from European locations.

Mondays

2300 Radio Canada Int'l: The World at Six. Half hour news magazine from the CBC domestic radio network.
2315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
2330 Radio Canada Int'l: As It Happens. Live telephone interviews with newsmakers around the world.
2330 Radio Finland: Compass North. See S 2330.
2337 Radio Netherlands (na): Newsline. See S 0037.
2350 Radio Japan: Close Up. See M 0350.
2352 Radio Netherlands (na): Let's Get to Business. Down-to-earth program of trade and business with Barry O'Dwyer.

Tuesdays

2300 Radio Canada Int'l: The World at Six. See M 2300.
2315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
2330 Radio Canada Int'l: As It Happens. See M 2330.
2330 Radio Finland: Compass North. See S 2330.
2337 Radio Netherlands (na): Newsline. See S 0037.
2340 Radio Finland: Finnish Press Review. See T 1240.
2345 Radio Finland: Environmental News. Weekly look at environmental issues in Finland.
2350 Radio Finland: Northern Lights. See T 1250.
2350 Radio Japan: Close Up. See M 0350.
2353 Radio Netherlands (na): Accent on Asia. A magazine program focusing on Asia with interviews and music.

Wednesdays

2300 Radio Canada Int'l: The World at Six. See M 2300.
2315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
2330 Radio Canada Int'l: As It Happens. See M 2330.
2330 Radio Finland: Compass North. See S 2330.
2337 Radio Netherlands (na): Newsline. See S 0037.
2340 Radio Finland: Finnish Press Review. See T 1240.
2345 Radio Finland: Finnish History. A look back at Finland during the the great war.
2350 Radio Finland: Northern Lights. See T 1250.
2350 Radio Japan: Close Up. See M 0350.
2352 Radio Netherlands (na): Encore!. Reruns of the best programs from earlier seasons.

Thursdays

2300 Radio Canada Int'l: The World at Six. See M 2300.
2315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
2330 Radio Canada Int'l: As It Happens. See M 2330.
2330 Radio Finland: Compass North. See S 2330.
2337 Radio Netherlands (na): Newsline. See S 0037.
2340 Radio Finland: Finnish Press Review. See T 1240.
2345 Radio Finland: Faiths in Finland (biweekly). A look at churches, Christian communities, and religious life in Finland.
2345 Radio Finland: Highlights (biweekly). A review of the arts and culture in Finland.
2350 Radio Finland: Northern Lights. See T 1250.
2350 Radio Japan: Close Up. See M 0350.
2352 Radio Netherlands (na): Research File. See T 0052.

Fridays

2300 Radio Canada Int'l: The World at Six. See M 2300.
2315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
2330 Radio Canada Int'l: As It Happens. See M 2330.
2330 Radio Finland: Compass North. See S 2330.
2335 Radio Finland: Starting Finnish. See S 1343.
2337 Radio Netherlands (na): Newsline. See S 0037.
2350 Radio Japan: Close Up. See M 0350.
2353 Radio Netherlands (na): Documentary. See H 0054.

Saturdays

2304 Radio Canada Int'l: Innovation Canada. See S 0307.
2310 Radio Japan: This Week. See S 0110.
2330 Radio Finland: Compass North. See S 2330.
2330 Radio Japan: The Week in Review. See A 0330.
2335 Radio Finland: Starting Finnish. See S 1343.
2337 Radio Netherlands (na): Newsline. See S 0037.
2353 Radio Netherlands (na): Bats; Balls & Baselines. Sports results, news, issues, features, personality profiles, and investigations.

HAUSER'S HIGHLIGHTS: SOUTH KOREA

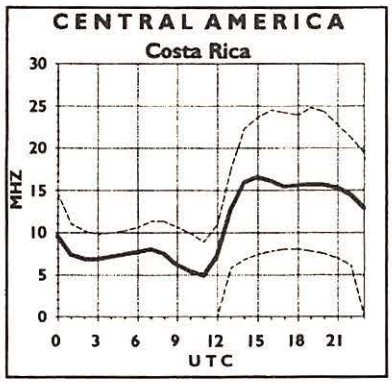
RKI English:

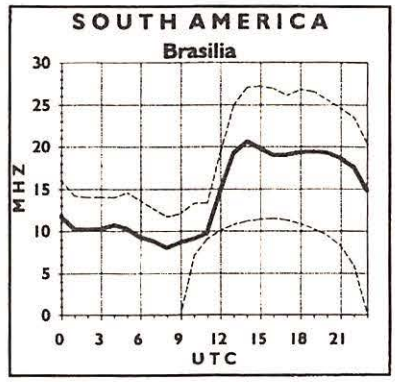
Time	Freq
0800-0900	7550, 13670
1130-1200	9650-Canada
1200-1300	7180
1230-1300	9570, 11740, 13670
1400-1500	5975, 7275, 11740
1600-1700	5975, 9515, 9870
1900-2000	5975
1930-2000	7250-England
2100-2200	6480, 15575
0100-0200	15575, 7550
0600-0700	11945

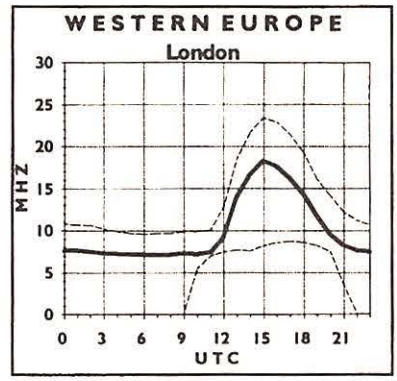
(via Tooru Yamashita, *RJMR*)
Fax: 82-2-781-3799 (RKI *SW Feedback*)

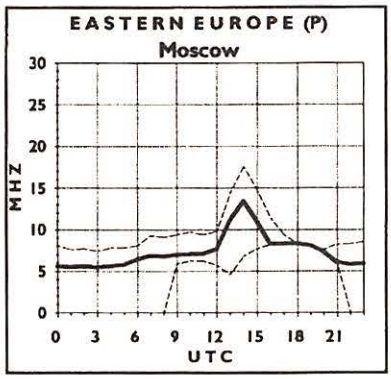
Propagation conditions: Eastern United States

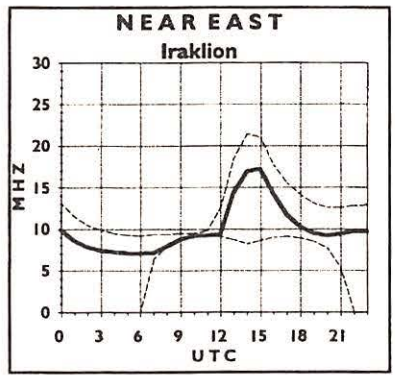
How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear. The Sun Spot Number used this month for forecasting purposes is 15.

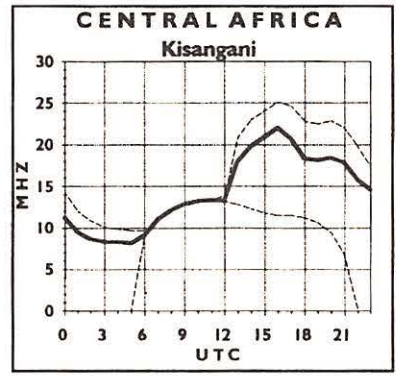


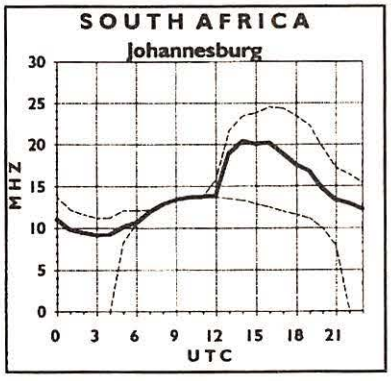


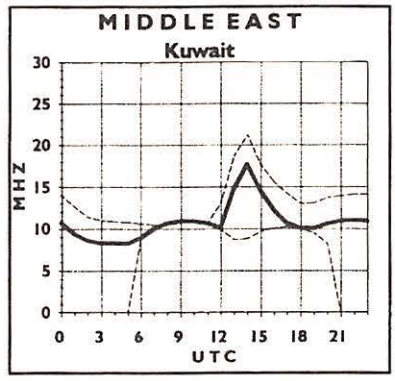


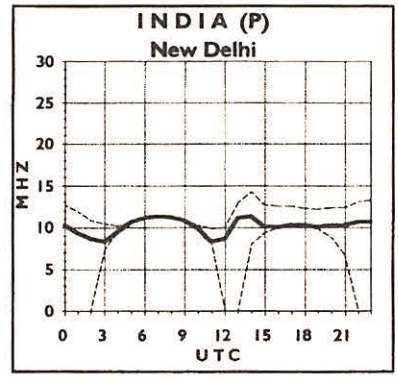


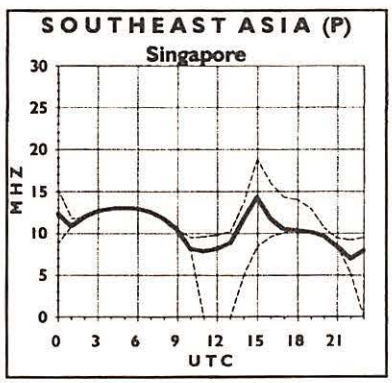


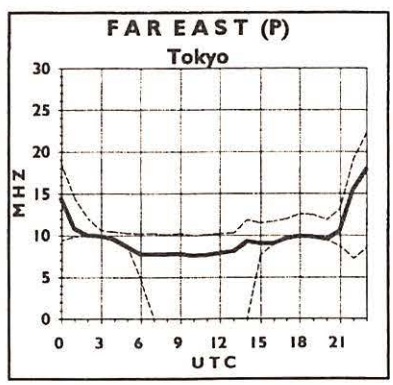


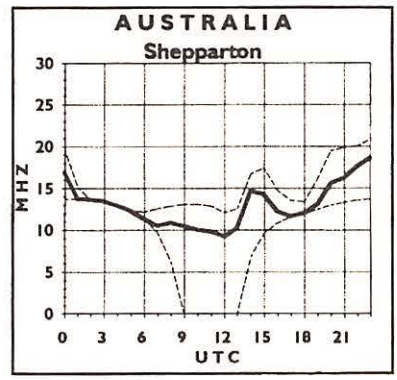






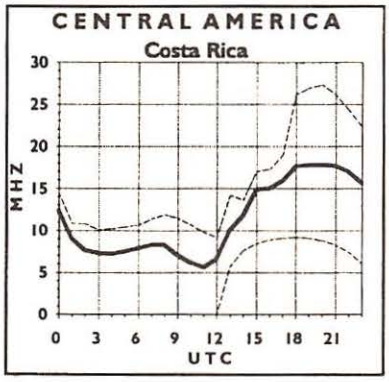


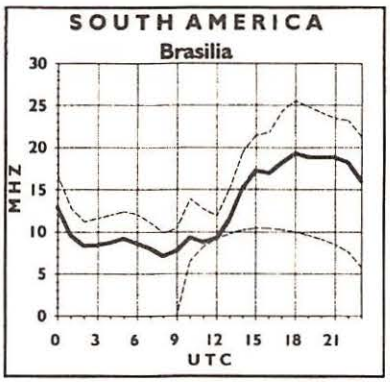


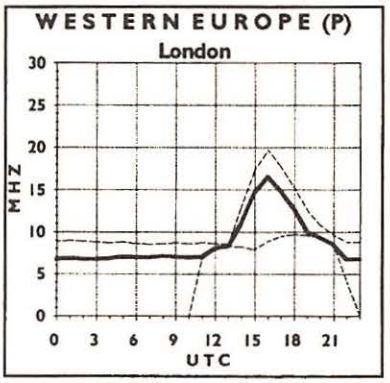


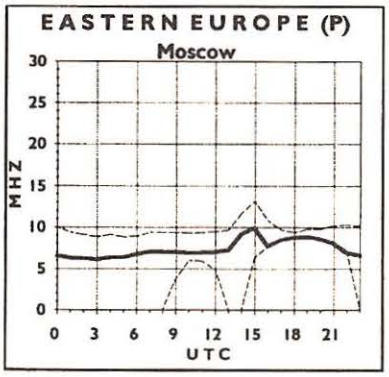
Propagation Conditions: Western United States

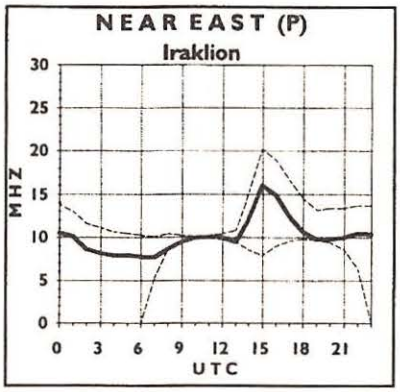
Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances.

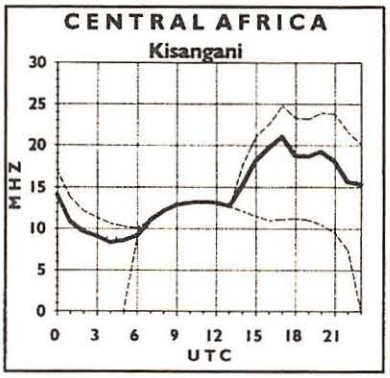


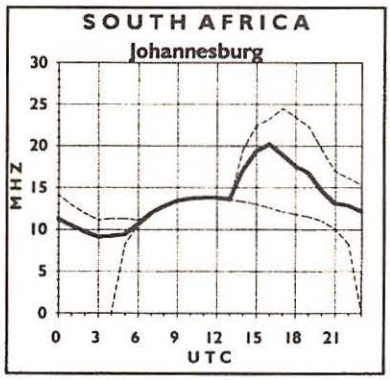


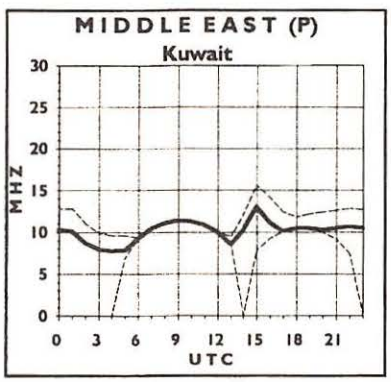


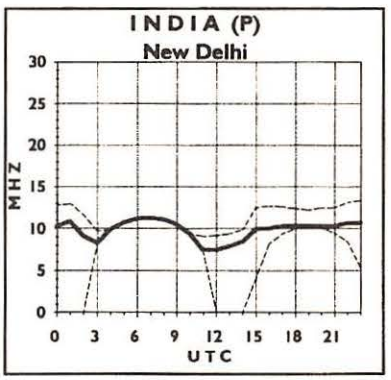


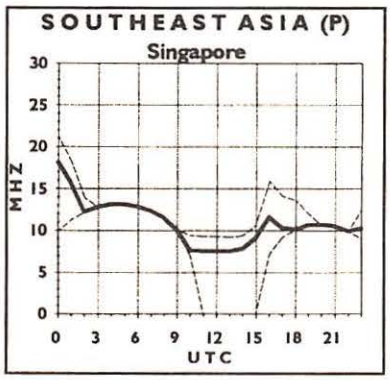


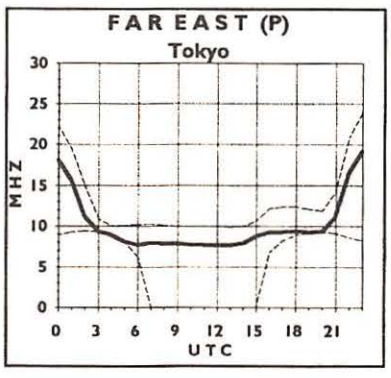


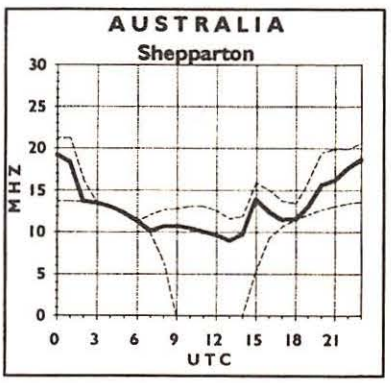












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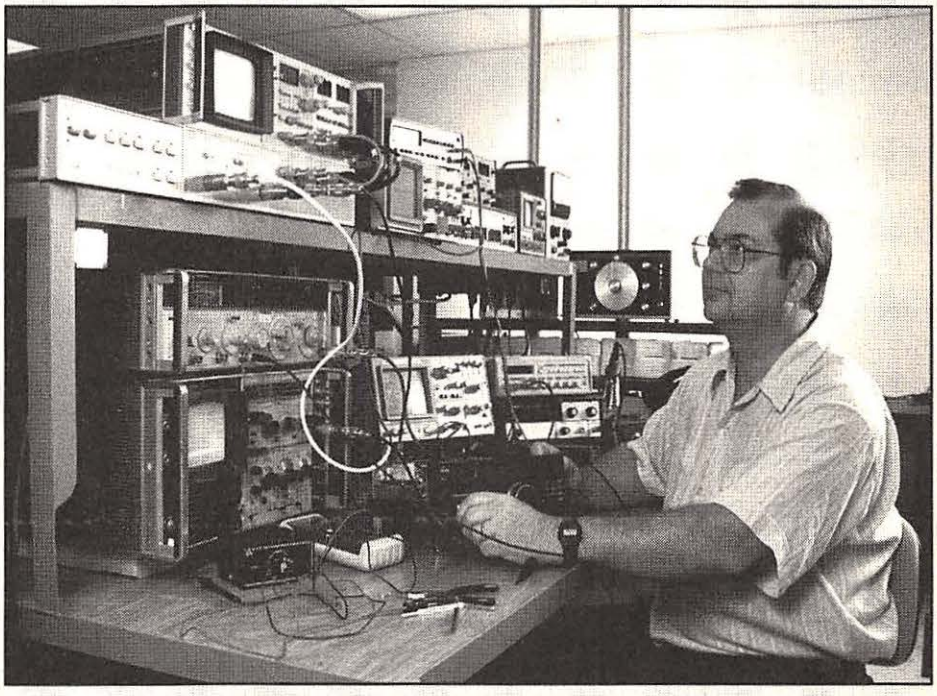

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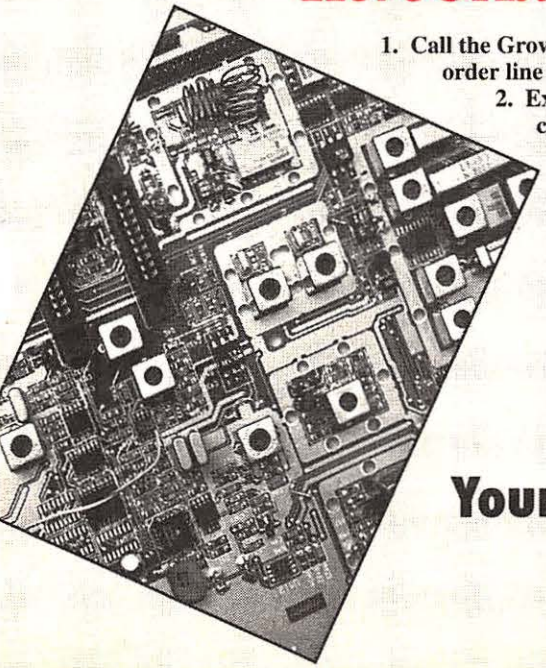

1. **Call the Grove Technical and Repair Support Line at 704-837-7081. (Please Do not call the 800 number order line operators; they provide sales and product availability information only.)**
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By Bob Evans
robert evans@MAGIC.ca

Monitoring ARQ Digital Codes

Welcome to the first Digital Digest column of 1995.

During the past year, we continued to lose more of the "mainstay" shortwave digital stations to the satellite band—a fact which bodes well for *Satellite Times* readers. However, don't plan on selling your shortwave decoders just yet; there are still plenty of signals left out there to monitor.

Starting with this issue, each column will profile one or more of the digital modes with a fairly comprehensive list of active stations this editor has frequently monitored.

For this column, we'll focus on three of the most common **ARQ** (Automatic Request) digital modes.

■ *ARQ-M2/4*

TDM Moore (Time Division Multiplex) is a seven bit, synchronous error-detecting Moore code. It utilizes a full duplex system which interleaves two or four separate data channels on a single carrier. The two channel system is known as **ARQ-M2**. The four channel system is called **ARQ-M4**.

It is possible for the two or four channels to transmit simultaneously. In reality, most TDM Moore stations are idle for hours, and when they transmit, the traffic may only be 15 to 20 seconds in length.

TNL, the ASECNA (Agence pour la Securite de la Navigation Aerienne en Afrique et a Madagascar) station in Brazzaville, Congo, is easily heard most evenings local time in eastern North America. They transmit in ARQ-M2 at 96/400 on a frequency of 8123.0 kHz. This station is unique in that both A and B channels are used to transmit different aeronautical messages at the same time.

Only a few **ARQ-M4** stations were ever monitored on the shortwave bands. The last stations to use this mode were the Vietnamese Embassies, and they have been silent for a few years now.

TDM Moore uses ARQ (Automatic Request) error protection, with the receiving stations transmitting control ACKs and NAKs. The French, British and German military make extensive use of this mode. A portion of the communications is encrypted.

Typical **ARQ-M2** Baud rates include 96, 100, 172, 192 and 200.

TABLE 1: *ACTIVE FREQUENCIES FOR ARQ MODE RECEPTION*

FREQ:	MODE	SETTINGS	UTC	CALL	STATION	CTRY	REMARKS	CID
4618.90	ARQ-E	96/170	0045	RFLIDA	FF Pointe-a-Pitre	GDL		
5100.10	ARQ-E3	192/400	0155				Idling (possibly JCO)	
5171.70	ARQ-E3	192/400	0215	RFFKCS	FF Brest	FRN	Idling	KQI
5266.70	ARQ-E3	192/425	0055	RFFA	FF Paris	FRN		IQJ
5397.70	ARQ-M2	200/400	0130	RFFP	MOD Paris	FRN	to N'djamena	FDX
5456.80	ARQ-E3	192/390	0200		FF Paris	FRN	Idling	
5788.00	ARQ-E3	100/400	0230	FIT35	Rennes Prefecture	FRN	to FIT75	RNY
5831.80	ARQ-E3	192/400	0220	RFQP	FF Jibouti	DJI	Idling	
5879.70	ARQ-E3	192/400	0140	RFLIO	FF Fort de France	MRT	also RFLCD	
6771.70	ARQ-E3	192/400	0000	RFLIA	FF Fort de France	MRT	to Provence	BFL
6775.00	ARQ-M2	96/400	0130	XTU	Asecna Ouagadougou	BFA	Idling	
6936.70	ARQ-E3	192/400	2345	RFLI	FF Fort de France	MRT	to Dakar	LIJ
6963.00	ARQ-E	72/400	0130	RFFX	Versailles	FRN	to RFFXQA	UAQ
7451.70	ARQ-M2	200/400	2350					
7524.00	ARQ-M2	96/400	0200	TYE	ASECNA Contonou	BEN		
7578.50	ARQ-??		0020					
7586.00	ARQ-E3	96/400	0255		FF Dzaoudzi	COM		
7606.70	ARQ-E3	100/400	2345	RFHI	FF Noumea	NCL	to Papeete	HIJ
7643.70	ARQ-E3	100/400	0000	RFVI	FF Le Port	REU	acc to Klingenfuss	
7714.00	ARQ-M2	96/400	0145	TJK43	ASECNA Douala	CME		
7772.00	ARQ-M2	96/300	0030	GYU	RN Gibraltar	GIB	in VFT signal	
7896.70	ARQ-E	96/400	0900	RFLI	FF Fort de France	MRT		
7902.00	ARQ-E3	100/400	0240	FIT75	MOI Paris	FRN	to FIT13	MAZ
7946.00	ARQ-E	96/400	0130	RFVIC	Le Port	REU	to Dzaoudzi	ITT
7976.70	ARQ-M2	200/400	0000		unid		Idling	
8094.70	ARQ-M2	192/200	2200	RFFVA	FF Paris	FRN	French AF	
8123.00	ARQ-M2	96/400	0045	TNL	ASECNA Brazzaville	COG	Channel A/B Tfc	
8143.60	ARQ-M2	96/150	0000					
8410.50	ARQ-M2	96/175	0100				Idling	
8509.00	ARQ-E	72.400	2200	RFFX	FF Versailles	FRN	to Bangui	XXI
8893.50	ARQ-M2	96/150	0015	CBDFD	Santiago Naval	CHL	Chilean Navy tfc	
9076.70	ARQ-E3	192/400	2330	RFFA	MOD Paris	FRN	to Libreville	ITF
9076.70	ARQ-E3	48/400	2250	RFFI	FF Paris	FRN	to Libreville	ITF
9126.70	ARQ-E3	50/400	0000	RFTJD	FF Douala	CME	to Paris	FTI
9126.90	ARQ-E3	192/380	0000	RFTJD	FF Libreville	GAB	to Paris	HAI
9983.70	ARQ-E3	100/400	0028	RFFIC	FF Paris	FRN	to Le Port RFVI	IRE
10103.70	ARQ-E3	192/400	2300	RFLI	FF Fort de France	MRT		IGU
10225.10	ARQ-E	48/850	2330	RFTJF	FF Port Bouet	CTI	to Libreville	JFD
10281.20	ARQ-E3	96/400	2350	RFLIG	FF Cayenne	GUF	to Fort de France	RTI
10283.00	ARQ-E3	100/400	2300	RFLIRT	FF Cayenne	GUF	to Fort de France	RTI
10365.70	ARQ-E3	48/380	0140	RFTJD	FF Libreville	GAB	to Port Bouet	JDF
10467.70	ARQ-M2	200/300	0015	RFPTC	FF N'djamena	TCD	to RFFA	
10493.70	ARQ-E3	48/400	0146	RFTJF	FF Port Bouet	CTI	to Dakar	JFJ
10638.70	ARQ-M2	200/400	2320	RFQP	FF Jibouti	DJI		QRG
10680.50	ARQ-E	72/400	0000	RFFXi	FF Bangui	CAF	to RFFX Versailles	XXI
10749.50	ARQ-E	192/400	2200	C37a	unid		Idling	
10798.30	ARQ-E3	96/400	2315	RFLI	FF Fort de France	MRT	to Cayenne	IRT
10800.00	ARQ-E3	100/850	2358	RFLI	FF Fort de France	MRT	to Cayenne	IRT
10814.20	ARQ-M2	200/400	2320	RFQP	FF Jibouti	DJI	to Paris RFAA	QPA
10869.20	ARQ-E3	100/400	0130		FF Le Port	REU		
10873.70	ARQ-E3	100/400	2218	RFVI	FF Le Port	REU	to Paris	REI
10917.70	ARQ-E3	48/400	0130	RFTJ	FF Dakar	SEN	to Port Bouet RFTJF	TJF
10950.20	ARQ-M2	200/400	2050	RFFA	MOD Paris	FRN	to RFQP	PQB
10956.80	ARQ-E3	48/400	0029				Idling	
11110.50	ARQ-E3	192/400	0200	RFLI	FF Fort de France	MRT	"BFL" to Provence	BFL
12090.20	ARQ-E3	192/425	0130	RFTJ	FF Dakar	SEN	to Provence	AFL
12134.20	ARQ-E3	100/400	2120	RFHIC	FF Noumea	NCL	to Le Port	HII
12190.20	ARQ-E3	100/400	2340	RFVI	FF Le Port	REU	to Noumea	VII
12283.00	ARQ-E3	100/400	2315	RFLIRT	FF Cayenne	GUF	to Fort de France	RTI
13310.00	ARQ-E	72/400	2110	RFFA	MOD Paris	FRN	to RFFXI	XXI
13593.80	ARQ-E3	192/375	0145	RFFIC	Provence	FRN	to RFTJC Cape Verte)	LFA
13846.70	ARQ-E3	100/400	0258	RFVIC	FF Le Port	REU	to Jibouti	RUN
14461.70	ARQ-E3	48/400	2330	RFTJFD	FF Port Bouet	CTI	to Libreville RFTCR	JFD

Continued on next page

ARQ-E Mode

ARQ-E is a synchronous, single channel, full duplex transmission mode similar to **ARQ-E3**. It utilizes a super-set of the Baudot (ITA2) code and likewise contains error detection. During idle periods, the signal has a characteristic singing sound which disappears when data is being transmitted.

The most common setting is a Baud rate of 72, with 48, 64, 86, 96, 144, and 192 also being used. As in other **ARQ** modes, a station may idle for hours. The French military is the major user of this mode.

ARQ-E3 Mode

ARQ-E3, a relatively new mode, is a synchronous, single channel, full duplex transmission mode utilizing the seven bit error-detecting Moore (ITA3) code.

Data streams contain only a single channel of text. The repetition cycle may be four or eight characters. The most common Baud rates are 48, 64, 72, 86, 96, 100, 192 and 200.

Similar to TDM Moore, **ARQ-E3** stations may be idle for hours without sending any traffic.

Typical **ARQ-E3** users include the French military and French overseas meteorological stations.

Wrapping It All Up

One of the interesting facts about all the ARQ mode stations is that they continue to transmit an idling signal when they are not sending traffic, and in many cases, this sound alone cannot be used to distinguish if traffic is actually being transmitted. This is why the decoders of today have some means of identifying an idle signal via an indicator of some sort. This also means that you can tune and synchronize your decoder to the idle signal, in readiness for when they do transmit.

Remember that the **Sense** (Polarity) of **Reverse** or **Normal** is determined by the audio stage of your receiver. For this reason, I have not included this factor in the logs. (For example, a signal that decodes using the Reverse position when the decoder is attached to a JRC NRD 525/535 will require the Normal position to be set if a Kenwood R1000/5000 or JRC NRD 515 is used.)

A Call For Logs

Since we intend to use more station logs in future columns, please send your intercepts to this column masthead via *Monitoring Times*. You can also e-mail me on Internet. My address is:

robert_evans@magic.ca

FREQ:	MODE	SETTINGS	UTC	CALL	STATION	CTY	REMARKS	CID
14481.70	ARQ-E3	48/400	1830	RFTJFD	FF Port Bouet	CTI		
14481.70	ARQ-E3	48/400	1930	RFTJ	FF Dakar	SEN		TJF
14484.00	ARQ-E3	96/400	2330	RFLIRT	FF Cayenne	GUF	to Paris	UGI
14485.70	ARQ-E3	192/400	1945		FF Cayenne			
14578.00	ARQ-E	72/400	2200	RFFXL	FF Beirut	LEB	To Versailles RFFX	XZL
14626.70	ARQ-E3	96/400	2125	RFLI	FF Fort de France	MRT	to Dakar RFTJ	LIJ
14633.20	ARQ-E3	96/400	2250		unid		Idling	
14669.00	ARQ-E	72/400	0010	RFTJ	FF Dakar	SEN	to Libreville	JDA
14754.00	ARQ-E	72/400	0000	RFFXI	FF Bangui	CAF	To Versailles	XZI
14926.70	ARQ-E3	48/400	2155	RFTJ	FF Dakar	SEN	to Libreville RFTJD	TJD
14927.70	ARQ-E3	192/400	1940	RFTJ	FF Dakar	SEN	not confirmed	
14959.70	ARQ-E3	48/400	1920	RFTJ	FF Dakar	SEN	"TJF"	TJF
14959.80	ARQ-E3	192/400	2300	RFTJ	FF Dakar	SEN	to Ft. de France RFLI	TJI
14964.00	ARQ-E	72/400	2200	RFFXL	FF Beirut	LEB	To Versailles RFFX	XXL
16014.00	ARQ-M2	96/400	2015	RFVI	FF Le Port	REU	to Jibouti	
16165.20	ARQ-M2	200/400	2230	RFFA	FF Paris	FRN	to RFQP	FDX
16324.70	ARQ-E3	48/400	0235	RFTJD	FF Libreville	GAB	to Dakar	JDJ
17550.90	ARQ-E3	192/400	2140	RFTJ	FF Dakar	SEN	to Paris RFFA	AFL
18447.70	ARQ-M2	200/400	2150	RFPTC	FF N'djamena	TCD	to RFFA Paris	
18503.70	ARQ-E3	192/170	2045	RFFA	MOD Paris	FRN	to RFLI	LFB
18553.70	ARQ-E3	192/400	1640	RFTJ	FF Dakar	SEN	C. De Voie	TJI
18966.70	ARQ-E3	192/400	1800	RFHJ	FF Papeete	OCE		
19048.70	ARQ-E3	192/400	2255	RFFA	MOD Paris	FRN	to RFTJ	ISG
19063.70	ARQ-E3	200/400	0025	RFFA	FF Paris	FRN	to N'Djamena	SPZ
19101.70	ARQ-E3	192/400	2100	RFLI	FF Fort de France	MRT	to Provence	BFL
19204.80	ARQ-E3	192/400	1820	RFLI	FF Fort de France	MRT	Idling	LIJ
19216.70	ARQ-E3	96/400	1820	RFLI	FF Fort de France	MRT		LIH
19386.70	ARQ-M2	200/400	2300	RFQP	FF Jibouti	DJI		
20179.80	ARQ-E3	100/400	2115	RFFA	FF Paris	FRN	to RFVI	IRE
20326.50	ARQ-E	96/400	1830		unid		Idling	
20348.20	ARQ-M2	96/350	1615	ORD20	Brussels	BEL	to Lubumbashi	
20633.70	ARQ-E3	100/400	2130	RFVI	FF Le Port	REU	to Paris RFFA	REI
20716.60	ARQ-E3	50/400	1500		FF Paris	FRN		
20754.80	ARQ-??	96/400	2010				Idling	
20756.30	ARQ-E3	96/400	1850		unid		Idling	
20758.20	ARQ-??	96/400	1730				Idling	
20813.70	ARQ-E3	50/400	1730				Idling	
23716.70	ARQ-E3	96/400	1950	RFLI	FF Fort de France	MRT	to Papeete	LIH
24871.70	ARQ-E3	96/400	2210	RFHJ	FF Papeete	OCE	To Ft.de France RFLI	CS HJL
26241.70	ARQ-E3	100/400	1350	RFVI	FF Le Port	REU	to Paris	REI

NOTE ON ADVERTISEMENT BELOW:

As of 4/26/94 it became unlawful to market cellular-capable receivers in the U.S. Atlantic Ham Radio assures us it will give a full refund and hold customers harmless from shipping expenses if a purchased unit is returned to the vendor by U.S. Customs.

Joe Eisenberg, WA0WRI

Listen in on Remote Broadcasts!

In their competitive struggle for market share and public recognition, radio stations take their image to the public in the form of remote broadcasts. These are a way that you, the listener, can meet the radio personalities first hand and get a glimpse of how they produce the programs you enjoy listening to. Outside of news coverage, the majority of "remotes" (as they are known by most broadcasters) include such things as store grand openings and sales, public festivals, parades, and local sports.

Remotes have appeal to devoted listeners because with the right equipment, you can hear a lot of behind-the-scenes activity! Being able to hear your favorite DJ or announcer talking while off the air can be very interesting. So, this month, we will look into how remotes are put together and how you can use them to get a special insight into broadcasting most listeners miss.

The logistics involved in getting the announcer's voice from microphone to transmitter become a bit more complicated when he is away from the studios. There are four main ways this is accomplished.

The easiest, but lowest quality way, is simply for the announcer to use an ordinary telephone and call into the studio. The main advantage of this method is that it requires no special equipment, other than access to any normal telephone. Its disadvantage is that it ties the announcer to the location of the phone, which can sometimes be far from the area of activity. The sound quality can be less than desirable, too. But, for many stations, this is the most reliable and inexpensive way to do remotes.

Next up the ladder is to use a telephone along with an audio compression device that allows a much higher fidelity sounding signal to be sent to the studio. The most popular of these is made under the name "Comrex." By using a technique not unlike placing two SSB signals on one channel, a wider frequency response can be sent on ordinary telephone lines. Some Comrex devices utilize two dial-up telephone lines to bring virtually studio quality audio across the miles. Two years ago, the Nebraska Football Network utilized such a system to bring the Nebraska-Kansas State football game to the network live from Tokyo, Japan, with amazing quality. So much so that some said it was better than some of their broadcasts of domestic games away from home! There are now a myriad of devices that use the telephone companies' ISDN or "Switch 56" capability to transmit data to carry digitized voice transmissions as well.

If the station does not want to use a standard telephone, cellular service can be used as well, with or without compression devices. With many cellular providers relying heavily on promotion and advertising via radio, it is natural that many stations use the cellular carrier that is their advertising client to carry their remote broadcasts. Special customized portable cellular units are available that have high quality microphone connections separate from the normal handset mike as well as having compression techniques built in.

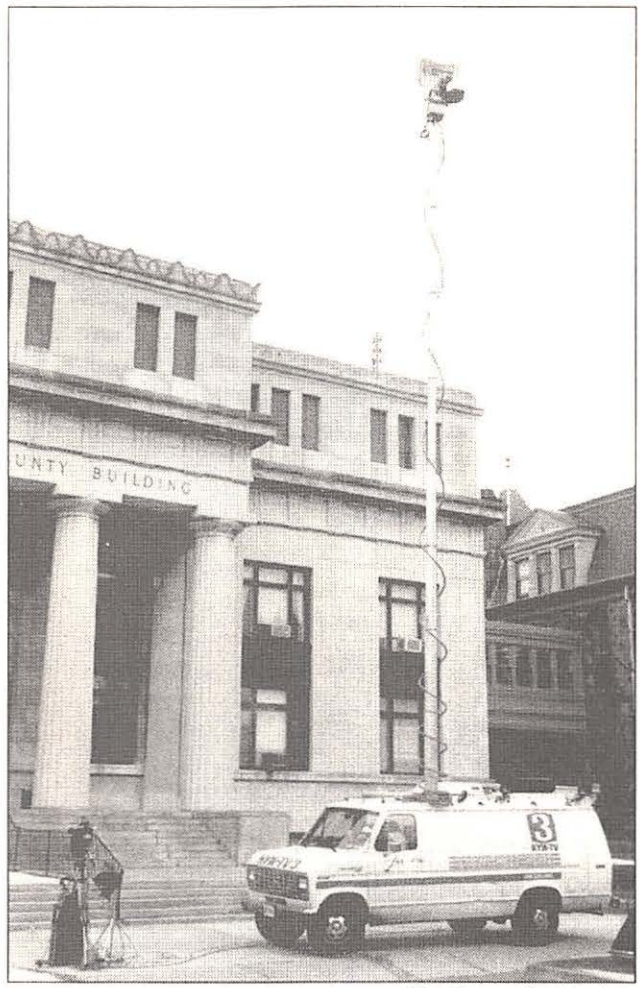


Photo Courtesy of Mark Swarbrick

But, a very popular way to do remotes is well within the reach of most scanner listeners. Called "RPU," short for "remote pick-up," several VHF and UHF frequencies are set aside for the purpose of allowing broadcasters to transmit news and programming back to the studio. These signals are narrowband FM, but can have deviation as wide as 10-15 kHz, compared to 5kHz for most normal VHF/UHF communications. Since this is very close to the normal bandwidth of narrowband FM communications, most scanners have no problem hearing these high fidelity signals. Many radio people refer to these VHF/UHF transmitters as the "Marti" as Marti Electronics is the largest manufacturer of these transmitters for the broadcast industry. Try the frequencies in TABLE 1 to hear remotes in your area! You will notice that some are near 26 MHz. Yes, they can and often are heard thousands of miles away along with the normal HF skip propagation near that frequency! There are a large number of stations that still use those channels, although many channels have been overrun by persons using illegally modified CB gear operating in the AM or SSB modes.

Sometimes, a station will use another one of these RPU channels for "IFB" or "interruptible feedback" (or "foldback"). This is a feed of the station audio along with the possibility of a voice from the studio being mixed in that cannot be heard on the air, giving the remote announcer time and program cues.

The comments heard on IFB channels can provide very entertaining listening. It also gives you an idea of what those TV and radio announcers are hearing in their headphones

TABLE 1

25.6-26.2 MHz	161.730 MHz
161.640 MHz	161.760 MHz
161.670 MHz	161.790 MHz
161.700 MHz	170.150 MHz

All from 450-451 MHz and 455-456 MHz

while out in the field reporting a story.

Another way to get an IFB signal to a remote location is to use the subcarrier of an FM station. Many AM stations use this facility of their "sister" FM outlets to bring IFB into hard-to-penetrate metal buildings and other noisy locations which make AM reception difficult. Subcarrier frequencies of 67 or 92 kHz are the most commonly used. Look for more on FM and TV subcarriers in future columns!

Another radio signal heard at many remotes is a wireless microphone! To allow for the announcer to roam the aisles in a store or get close to the action on the sidelines at a football game, wireless mikes have become another tool in the broadcaster's remote arsenal. You can find these mostly from 170 MHz upwards, and especially in the TV band from 174-216 MHz. Scan unused TV channels in your area for these mikes! There are even some newer models operating in the UHF TV spectrum.

Watch for more remotes during ratings periods when the station is anxious to show itself in public. Some stations have huge motor homes equipped as fully functional studios! There are custom trailers being made that resemble a giant "boom box" that have also appeared lately. Other vehicles, ranging from old hearses and ambulances to stretch limousines and big pickup trucks, serve to carry the station's image and remote equipment to the public.

Watch for upcoming high school football and basketball games and new store openings for remote broadcasts. DXing the 26 MHz feeds can be a lot of fun, too! Being in a college football town (Lincoln, Nebraska) has provided me some wonderful opportunities to tune in behind the scenes communications of such well-known broadcasters as ABC Sports and ESPN. Basketball season brings those networks as well as regional coverage, such as Raycom and other TV and radio production crews, including those from the visiting teams.

■ *Bits and Pieces*

• Listeners to clear-channel giant, WOWO in Fort Wayne, Indiana, are protesting a possible lowering of WOWO's nighttime power and coverage. The station was recently sold to a company that owns another station, located in New York City, that shares the same frequency and must go silent at night to protect WOWO's clear channel. By buying WOWO, WLIB in New York City can apply to have authority to broadcast at night and modify sister station WOWO's coverage to protect WLIB from nighttime interference, ending WOWO's clear channel reign.

• Do you own one of the Grundig digital AM-SW-FM receivers that has "RDS" capability? RDS, now called "RBDS" in this country is a way of sending text messages to listeners that are displayed on the radio's digital front panel display. As RBDS equipment gets less expensive and easier for FM broadcasters to install, more RBDS capable stations will be available to hear and SEE!

Stations using RBDS send interesting text tidbits, such as song titles and artist names, special promotional sale offers from advertisers, and station ID and format information for specially equipped receivers. Just select the format you want and the radio will scan and find it for you! Dxers will love the frequent ID information transmitted on this subcarrier, making waiting for hourly IDs obsolete!

John Fulford, WA4VPY

The Advantage of Technology

Another *Monitoring Times* Convention has come and gone. It was good to meet all of you who came up to Atlanta to share your ideas and experiences. The hidden transmitter hunt, which I coordinated again this year, involved using multiple transmitters on the same frequency scattered throughout the hotel. A "bug hunt" is a chance to engage in a little sleuthing in a totally safe environment—with some competition thrown in to substitute for the thrill of the real thing. If you enjoyed this year's topics and transmitter hunt—just wait until next year!

"What does this have to do with Federal monitoring?" you may be asking yourself. Prior to coming to Atlanta, I had purchased a new piece of equipment for the monitoring shack. You may recall that one of my first columns dealt with using the spectrum analyzer in our search for new frequencies. Needing a smaller, and cheaper, analyzer/receiver for my car, I purchased a Standard CCR-708A Communications Test Receiver with Spectral Display Scope. This is a great little receiver that tunes 50-904.555 MHz, with *NO* gaps.

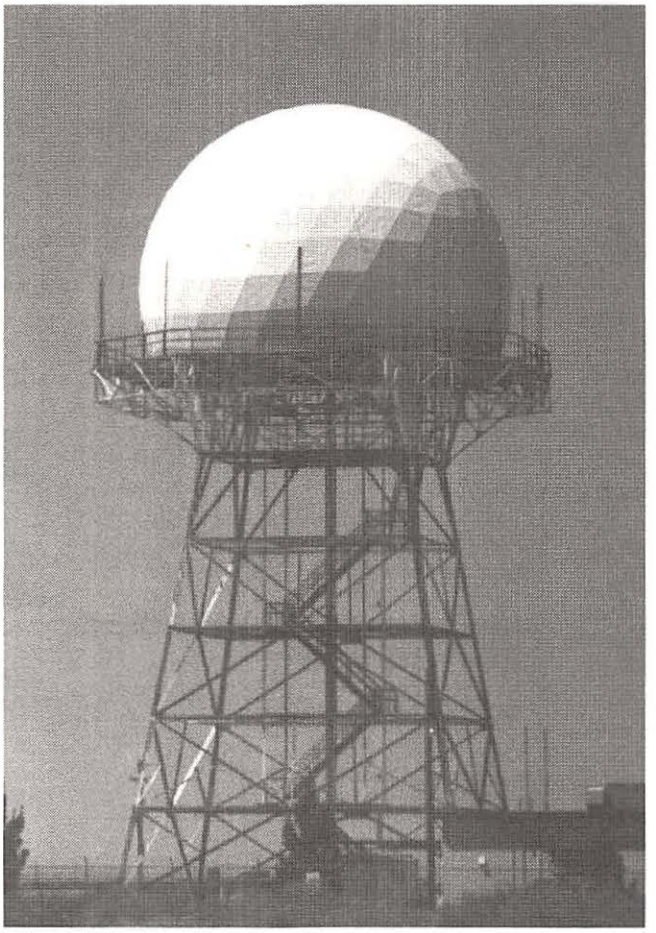
It has variable steps in tuning, such as 5, 10, 12.5, 15, and 25 kHz steps. The spectral display, while not a true spectrum analyzer, will show the spectrum up to 500 kHz on each side of center frequency. However, a product review is not the purpose of this month's column, so you will have to try one for yourself to check out the finer points.

I was driving in the South Florida area tuning the above receiver with my right hand—yes, I am using it mobile—when I detected a detected an open microphone on 166.9625 MHz. Thinking it was a new FBI frequency, I continued listening while driving past the intersection. The carrier dropped off a couple of blocks away from the intersection.

Well, how about that?—I had found a real-world hidden transmitter. A check with my old sources confirmed that it did not belong to any regional police or intelligence unit. To make a long story short, six weeks later, it is still there. Who installed it or who is listening is unknown, but from what I have monitored coming from it, it is really BORING... (I did discover *where* it is installed.)

While I was monitoring the hidden transmitter and using the spectral display scope, what should show up but a new active frequency—167.2625 MHz. This is assigned to the FBI. It is being used as a repeater output, with an unknown input. For three days, I have heard the usual DVP/DES format, plus tones and what sounds like the bubble jammers heard on the 7 and 8 MHz bands. It's unknown what is going on, but this bears watching, or listening, if you wish.

The moral of the above is that, by adapting to the new technologies, we gain valuable new tools. Using the spectral display scope to monitor the above room transmitter and the new FBI frequency, I was able to check out the entire 167 MHz band, confirming the use of all of the 167 MHz frequencies heard in South Florida at my monitoring location.



Border Radar, one of the many devices used to monitor national borders by the U.S. Border Patrol. Photo by Harry Baughn

Border Patrol

With the influx of foreign nationals coming ashore in the South Florida area, let us look at the radio system used by the Border Patrol/Immigration units. I wrote several columns ago that I was not hearing the point-to-point links that I had grown up listening to. These links, all in the 406-420 MHz band, connected all of the Florida peninsula with the Miami operations center.

By listening to one of the links—for example, 408.3 MHz—you could monitor a good portion of the radio traffic. By monitoring two or three of these links, you could hear all of the 163 MHz traffic in the state. Then one day they all disappeared.

A letter from a loyal reader inside of the Department of Justice, who wishes to remain anonymous, wrote that due to budget cutbacks the radio links were gone and had been replaced by telephone lines. The same is happening along the U.S./Mexico border and in the State of California. Oh well, it's the end of an era.

The Miami Operations Center is composed of three divisions. They are:

Miami Sector

City	Rptr Input	Rptr Output
PENNSUCO	162.925	163.625
MIAMI	162.825	163.625
FLORIDA CITY	162.825	163.725
TAVERNEER	162.825	163.675

BIG PINE KEY	162.825	163.625
KEY WEST	162.925	163.675
West Coast		
MILES CITY	162.825	163.775
ALVA	162.825	163.675
ARCADIA	162.925	163.625
MYAKKA CITY	162.825	163.725
TAMPA	162.925	163.675
CLEARMONT	162.925	163.625
WINTER HAVEN	162.825	163.775
East Coast		
HILLSBRO INTL	162.925	163.725
W. PALM BCH	162.825	163.675
FT. PIERCE	162.825	163.625
FT. DRUM	162.825	163.725
DEER PARK	162.825	163.675
OSTEEN	162.925	163.725
SAN MATEO	162.925	163.625
LAKE BUTLER	162.825	163.725

Along the U.S./Mexico border, the buried border intrusion alarms are in the 170 MHz region, with the following frequencies reported: 170.700, 170.775, 170.625, 170.650 MHz.

There are several anti-smuggling radio systems which are not a part of the usual BP/INS radio system. They are:

Chula Vista Section

City	Input	Output
SANTIAGO PEAK	168.975	165.875
SIMPLEX	165.875	
LOS ANGELES	168.875	165.975
SIMPLEX	165.975	

The Border Crimes Task Force uses the following frequency format:

	Input	Output
	168.925	165.850
SIMPLEX	165.850	
TACTICAL	163.850	

There is a radio link in San Clemente going up to Los Angeles. The input is 168.950 MHz and the output is 165.825 MHz. There is also another link on 165.900 MHz. **All of the above systems use a sub-audible tone of 100.0 Hz.**

The following is the national assignment of Border Patrol/Immigration Service.

Use	Input	Output
UNKNOWN USE-SIMPLEX	163.375	163.375
SPECIAL OPERATIONS GROUP	63.050	163.050
SOG	163.100	163.100
BP—CH1	162.825	162.825
DETENTION CENTERS	162.850	162.850
BP—CH8	162.875	162.875
BP-TACTICAL	162.900	162.900
BP—CH2	162.925	162.925
SOG	162.950	162.950
BP—CH8	162.975	162.975
BP—CH4	162.925	163.675
BP—CH3	162.925	163.625
DETENTION CENTERS	163.550	163.550
BP—CH12	163.600	163.600
BP—CH3	162.825	163.625
BP—CH9	162.950	163.650
BP—CH11	163.6625	163.6625
BP—CH4	162.975	163.675
BP—CH7	162.825	163.725
BP—CH5	163.9625	163.9625
TACTICAL	162.900	163.700
UNDERCOVER SIMPLEX	163.750	163.750
BP—CH6	165.825	163.775
BP—CH7	162.925	163.725
BP—CH6	163.925	163.775
BP—CH7	162.875	163.725
BP—CH7	162.975	163.725
ANTI-SMUGGLING	165.850	165.850
SOG	165.925	165.925
SOG	165.975	165.975
ANTI-SMUGGLING	165.800	165.800
ANTI-SMUGGLING	165.825	165.825
ANTI-SMUGGLING	165.875	165.875
SOG	165.900	165.900
SOG	165.975	165.975
ANTI-SMUGGLING	165.875	165.875
SOG	168.350	168.350
SOG	168.825	168.825
SOG	168.850	168.850
BP—CH10	168.8625	
BORDER ALARMS—SIMPLEX	170.675	
BP-ALARM	170.700	
BP-ALARM	170.750	
BP-ALARM	170.625	
BP-ALARM	170.650	
BP-ALARM	170.775	
BP-ALARM	171.725	
CONTROL LINK	413.675	418.850
CONTROL LINK	413.550	418.850
CONTROL LINK	162.925	418.850

The Krome Detention Center, which is west of Miami and was the next door neighbor of the now departed KKN39 transmitter site, does not use the standard Bureau of Prison frequencies for its operational works. They use the following:

Channel	Frequency
1	162.825
2	162.925
3	163.625
4	163.675
5	163.725
6	163.775

That's it for this month. Happy holidays to you all. 73's—John WA4VPY

James R. Hay

New York, New York — What a busy town

Another new year has started. I hope that you all enjoyed a happy holiday and that Santa Claus was good to you. The winter propagation is settled in and we should be able to enjoy a few months of improved listening and DXing until the summer returns.

One of the busier ports in the United States is New York with a variety of traffic—both vessels and radio. This month we will have a look at some of the stations which can be heard in, or from, New York City.

Manhattan Island photo courtesy of New York C&V Bureau

Pilot Boats

While the traffic between pilot boats, their stations, and the ships which they serve can be quite routine, it does offer useful information on the comings and goings in the harbor. Since any foreign ship, and all but the most regular of visitors, must take a pilot, these communications will prove informative.

Freq.	Station	Callsign
156.675	United & NJ Sandy Hook pilots	WQB 566
156.800	United & NJ Sandy Hook pilots	WQB 566
156.900	Hudson River Pilots Corp	WRD 647
156.800	Hudson River Pilots Corp	WRD 647
156.450	Hudson River Pilots Corp	WRD 647
156.975	United Pilots Association	WHF 736
156.725	United Pilots Association	WHF 736
156.800	United Pilots Association	WHF 736

Towing Companies

Next on our list of helpful stations are the towing companies. Even with the advent of bow thrusters, ships still require tugs to help them into, and out of, tight spots. There are also salvage operations to be heard mixed in with the routine stuff.

Freq	Station	Callsign
156.425	Sea Tow Services	WHX 230
156.450	Sea Tow Services	WHX 230
156.975	Sea Tow Services	WHX 230
156.800	Sea Tow Services	WHX 230
156.975	Kosnac Floating Derrick Corp	KTD 547
156.800	Kosnac Floating Derrick Corp	KTD 547
156.950	Red Star Towing & Trans Co	KUF 646
156.800	Red Star Towing & Trans Co	KUF 646
156.350	Moran Towing & Transportation	WBV
156.800	Moran Towing & Transportation	WBV
156.450	City Island Marine Towing Inc	WHX 937
156.800	City Island Marine Towing Inc	WHX 937
156.500	Harbor Tow & Salvage	KMD 304
156.800	Harbor Tow & Salvage	KMD 304
157.025	City Island Marine Towing Inc	WHX 667
156.450	City Island Narine Towing Inc	WHX 667
156.800	City Island Marine Towing Inc	WHX 667
156.800	Great Lakes Dredge & Dock Co	KBP 350
156.350	Great Lakes Dredge & Dock Co	KBP 350
156.900	Turecamo Coastal & Harbor Towing	WHG 959
156.800	Turecamo Coastal & Harbor Towing	WHG 959
156.900	New York Towing Line Inc	KZH 804
156.800	New York Towing Line Inc	KZH 804

Of these towing companies, Moran Towing and Transportation, Turecamo Coastal and Harbor Towing, and Great Lakes Dredge and Dock are prominent in long distance towing, and they can prove interesting catches on the air. Also, Great Lakes Dredge and Dock has been involved in many dredging and construction projects. In a future column we will have a more detailed look at some of the towing companies and their operations.

Yacht Clubs and Marinas

Every ship's officer loves to hate the pleasure craft operator. Small boats frequently get in the way and cause all manner of problems for the professional mariner. Their incessant chatter on the pleasure craft channels in the VHF marine band can drive one to distraction, but they can be amusing to listen to occasionally. Yacht Clubs and marinas can have interesting traffic as boats come in needing repairs, as races are in progress, or as a member makes a reservation for dinner.

Freq	Station	Callsign
156.425	Ampere Fishing & Yacht Club	WHW 212
156.800	Ampere Fishing & Yacht Club	WHW 212
156.575	North Minneford Yacht Club	WXZ 358
156.800	North Minneford Yacht Club	WXZ 358
156.475	North Cove Yacht Harbor Mgmt Co	WXZ 564
156.800	North Cove Yacht Harbor Mgmt Co	WXZ 564
156.425	Bowery Bay Boat Club	WHX 974
156.800	Bowery Bay Boat Club	WHX 974
156.450	Bridge Boat Sales Ltd	WHV 789
156.800	Bridge Boat Sales Ltd	WHV 789
156.450	Bridge Boat Sales Ltd	WHX 946
156.800	Bridge Boat Sales Ltd	WHX 946
156.450	Bridge Boat Sales Ltd	WHU 206
156.800	Bridge Boat Sales Ltd	WHU 206

Oil Companies

Here is another place that might surprise you with its interesting listening. In a world which is driven by oil, the transportation of this commodity is vital. Oil companies maintain their own communications companies just to keep in touch with their tankers. Ships have to be bunkered and make arrangements with the oil companies, either to move to the bunkering docks, or for a visit from a refuelling barge. Here are a couple of examples of what the petroleum business has to offer.

Freq	Station	Callsign
156.975	Morania Oil Tanker Corp	KPB 566
156.800	Morania Oil Tanker Corp	KPB 566
4.1504	Morania Oil Tanker Corp	KPB 566
6.2254	Morania Oil Tanker Corp	KPB 566
8.2954	Morania Oil Tanker Corp	KPB 566
12.3544	Morania Oil Tanker Corp	KPB 566
2.1834	Morania Oil Tanker Corp	KPB 566
2.1834	Morania Oil Tanker Corp	KPB 566
2.0664	Morania Oil Tanker Corp	KPB 566
156.800	Mobil Oil Telcom Ltd	KBP 360
157.025	Mobil Oil Telcom Ltd	KBP 360
157.025	Mobil Oil Telcom Ltd	WQX 628
156.800	Mobil Oil Telcom ltd	WQX 628

Since there are so many oil companies which have their own fleets and communications systems, and since there are some very large and important tanker operators, this is another topic which will be revisited in future columns.

Here and there about town

The remainder of this listing is representative of the variety of businesses on the maritime band: There are shipping companies, shipping agents, electronics firms, communications companies, and others.

Marine terminals will often have a radio station to contact incoming ships to confirm estimated times of arrival and the facilities which will be required, such as unloading equipment and manpower.

Freq	Station	Callsign
156.975	Castle Port Morris Terminal	KR 9539
156.800	Castle Port Morris Terminal	KR 9539

I don't know exactly why the State University has a station, but judging by their use of HF SSB frequencies, they are likely to be involved in oceanic research.

Freq	Station	Callsign
4.125	State Univ of New York	KXS 294
6.224	State Univ of New York	KXS 294
8.294	State Univ of New York	KXS 294
12.353	State Univ of New York	KXS 294
16.531	State Univ of New York	KXS 294
22.159	State Univ of New York	KXS 294
156.350	State Univ of New York	KXS 294
156.450	State Univ of New York	KXS 294

Marine surveyors are often required to carry out inspections of ships to determine their conditions for insurance purposes, to assess damage for an insurer, or to give their opinion on the soundness of a ship when it is being sold.

Freq	Station	Callsign
156.500	Poseidon Marine Surveys Ltd	WHV 296
156.800	Poseidon Marine Surveys Ltd	WHV 296
156.325	Boyd Weir & Sewell Inc	KZO 269
156.450	Boyd Weir & Sewell Inc	KZO 269
156.800	Boyd Weir & Sewell Inc	KZO 269
156.800	Bouchard Transportation Co Inc	KQU 414
156.500	Bouchard Transportation Co Inc	KQU 414
157.250	Nymar Communications Corp	KQU 537
156.800	Nymar Communications Corp	KQU 537
156.425	Strachan Shipping Co	KXE 296
156.800	Strachan Shipping Co	KXE 296
156.675	Amerada Hess Communications Co	KLY 833
157.025	Amerada Hess Communications Co	KIY 833
156.800	Amerada Hess Communications Co	KIY 833
157.400	Nymar Communications Corp	KQU 539
156.800	Nymar Communications Corp	KQU 539
156.900	Maritime Association of NY\NJ	WHU 422
156.675	Maritime Association of NY/NJ	WHU 422
156.800	Maritime Association of NY/NJ	WHU 422
157.400	Nymar Communications Corp	KQU 540
156.800	Nymar Communications Corp	KQU 540
22.1604	Avior Shipping Inc	WXZ 485
16.5294	Avior Shipping Inc	WXZ 485
12.3544	Avior Shipping Inc	WXZ 485
8.2954	Avior Shipping Inc	WXZ 485
6.2254	Avior Shipping Inc	WXZ 485
4.1264	Avior Shipping Inc	WXZ 485
156.450	Worms Agencies Inc	KA9 7333
156.800	Worms Agencies Inc	KA9 7333
157.400	Nymar Communications Corp	KQU 538
156.800	Nymar Communications Corp	KQU 538
156.500	Ravenscroft Shipping Inc	KIL 894
156.800	Ravenscroft Shipping Inc	KIL 894
156.450	Worms Agencies Inc	WHV 314
156.800	Worms Agencies Inc	WHV 314
156.475	Sound Marine Corporation	WHX 307
156.450	Sound Marine Corporation	WHX 307
156.800	Sound Marine Corporation	WHX 307
156.450	Poling Transportation Corp	KZB 618
156.800	Poling Transportation Corp	KZB 618
156.800	Poling Transportation	KEJ 765
156.450	Poling Transportation	KEJ 765
22.1634	Eklof Marine Corp	KYR 822
16.5354	Eklof Marine Corp	KYR 822
12.3604	Eklof Marine Corp	KYR 822
8.2954	Eklof Marine Corp	KYR 822
6.2254	Eklof Marine Corp	KYR 822
4.1264	Eklof Marine Corp	KYR 822
156.450	Worldwide Electronic Corp	KIY 662
156.800	Worldwide Electronic Corp	KIY 662
156.725	Breakwater Marine Services	WHX 395
156.500	Breakwater Marine Services	WHX 395
156.450	Breakwater Marine Services	WHX 395
156.800	Breakwater Marine Services	WHX 395
156.250	Eklof Marine Corp	KBP 380
156.800	Eklof Marine Corp	KBP 380
162.000	Niagara Communications Inc	WHU 738
156.800	Niagara Communications Inc	WHU 738
156.725	Henry Marine Service Inc	KZP 852
156.800	Henry Marine Service Inc	KZP 852
156.350	Henry Marine Service Inc	KZP 852

While most of these stations are on VHF, there are many HF and MF stations in and around New York. The stations I have listed are actually in New York City, but there are many others in New Jersey, Long Island, and other New York cities and towns.

New HF station in Newfoundland

A new HF station has been opened in Newfoundland by KFS World Communications. VCT has been added to the the company's two existing stations, KFS and WNU. In March we will look at this new station and the services which it and its two sister stations offer.

Until next time, enjoy the winter, keep listening, and don't forget to share your good loggings. Other readers will be interested to know what is being heard from your part of the world.

Ken Reitz, KC4GQA

A Question of Trade-Offs

Let me guess. You didn't win the lottery, and now you have to think twice before shelling out for your monitoring cravings. If you're like the rest of this crowd, your interests more than likely are spread all over the RF map. How can you make as much of what's left of your disposable income go as far as possible? We'll look at what you need, what you don't need, and what you may already have. There may be a couple of pieces of gear already at your monitoring post which will do double duty for satellite monitoring.

Ku or Not Ku?

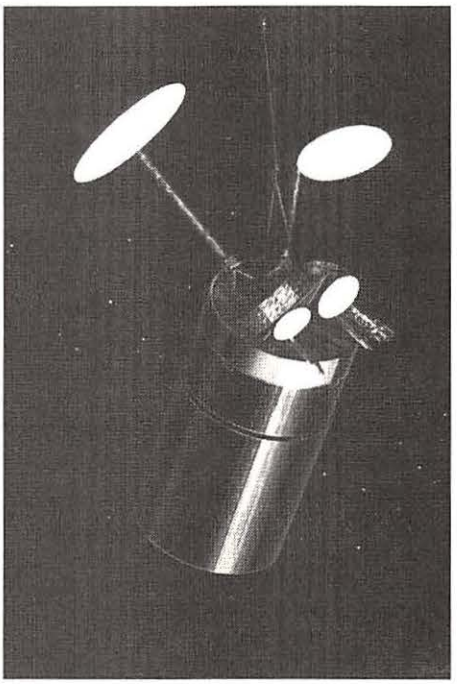
Since the bulk of satellite broadcasting is still done on the C band, newcomers to the hobby will spend their first months combing the hundreds of channels for various audio and video transmissions. It's usually not long before they're eager to explore the Ku band as well. Two questions come to mind. First, is there enough action on Ku to justify retrofitting your system, and second, is it worth putting Ku capability on your dish to begin with?

The answer is that it's a question of trade-offs. There is far less in the way of transmissions on Ku; however, it is the only place I've found the BBC *Seven O'Clock News*. Still, my advice is that if money is a big concern, don't bother.

The plain C-band feedhorn runs about $60 retail. A decent (40 degree) LNB runs about $70. Thus, for $130 you're all set for C-band viewing. If you were to later up-grade your system for Ku you would have to scrap the feedhorn for a combined C/Ku feed which retails at about $125. You can put your old C band LNB on your new C/Ku feed. Still, you're out $60 for the now unused C-band feed. A decent (1.0 dB) Ku LNB will run about $80. Total investment for C/Ku retrofitting: $325, or about $200 more than C-band only.

What About Intelsat?

I'm often asked a similar question with regard to the Intelsat satellites. These are the satellites which "bridge" the Atlantic and are used heavily by broadcasters from both Europe and North America. The two most critical questions are, "What will it take to be able to view these satellites?" and "Is there anything there that's worth going to all that trouble?"



The latest generation Intelsat satellite, made by Hughes Aircraft Company, stands 39 feet high with its antenna system unfolded and aft solar panel extended. These birds dot the skies over the Atlantic. Reception by TVRO systems is difficult; are they worth the extra effort? Courtesy Hughes Aircraft.

To view these satellites you'll need to meet the following criteria: Be east of the Mississippi; have a clear view to the east southeast; a ten foot diameter or larger dish; a horizon-to-horizon dish drive or a 36" linear drive; a circularly polarized feedhorn; and a PAL/SECAM/NTSC video standard television.

A formidable list! But, supposing you had them all, what would you see? The eastern-most satellite most Americans can see is Spacenet 2 (69° W). Intelsat 513 (53° W) is as far east as I can go, on which I find TV 5 from France, ITN from England, and assorted other feeds. Next is Intelsat 506 (50° W) which has four channels of Latin American programming. After that is Panamsat F1 (45° W) which features some 20 channels, most of which are spot beamed to specific locations in South and Central America and some of which are encrypted via the B-MAC system. East of that is Intelsat 601 (27.5° W).

Looking this far east will require some very sophisticated gear, such as a dish 12 to 16 feet in diameter plus circular feedhorn. Beyond these satellites, locations not on the East Coast will likely be out of the footprint.

Now, let's go back to the list and tally up the costs. Typically a 12 footer will cost $400 more than a 10 footer. A 14 foot dish will cost $1,000 more than a 10 footer, and a 16 foot dish will cost an additional $2,000. (See a pattern here?) One pays dearly for the extra attraction of seeing the European birds. You'll also need to replace your current 18 or 24 inch actuator motor with a 36-inch drive or a horizon-to-horizon drive. Either is expensive—a 36-inch drive will cost about $250; horizon-to-horizon about $350.

To properly see the circularly polarized signals you'll need to have an "Intelsat" feed which will cost about $300. Bottom line: it will cost between twelve and fifteen hundred dollars for the privilege of watching the European birds.

SCPC Receiver or What?

One of the more interesting aspects to this hobby is listening to all the radio feeds on the channels which carry Single Channel Per Carrier signals. Many TVRO mail order houses carry a consumer grade SCPC receiver for about $450. Yet, as I have mentioned many times, there are cheaper methods. One is to use the 70 MHz loop on the back of your satellite receiver (Method A).

Here's how to do it. Make up an interface kit consisting of three short lengths of RG/58 cable and a 75 ohm splitter. Attach one length to the 70 MHz loop "out" and to the splitter. Attach the second length to one of the outputs of the splitter and to the antenna of a radio which tunes the TV band (chan. 2-6). Attach the third length to the other leg of the splitter and back to the "in" of the 70 MHz loop. Now set the radio to tune the TV channels. With your satellite receiver on Galaxy 6 channel 3, slowly tune your radio through the band. You'll hear dozens of radio stations.

Many receivers don't have the 70 MHz loop. Find out what kind of loop there is and attach a radio capable of tuning that frequency in the manner described above.

Method B: Another way is to split the signal from the LNB using a special 950-1450 MHz splitter which has a DC block on one leg. Using the splitter, feed the satellite receiver with the leg which passes the LNB voltage and feed your scanner (capable of tuning 950-1450 MHz) with the leg with the DC block. You will need wide/narrow FM tuning on your scanner to tune in the signals. You'll be able to tune in FM Squared (FM^2) signals as well.

Here are the trade-offs. A stand-alone SCPC receiver is the best way to listen to SCPC reception, but it is useless for any other listening. For the same $450 you could purchase a medium-priced scanner. It's not quite the best of both worlds: the audio via the scanner is not as good as that of the SCPC receiver, and some scanners may not be sufficiently selective.

If you already have a scanner, you're all set to experiment with Method B. If not, try the cheap'n'easy Method A and see what you think. If you find yourself listening to it a lot, it might be time to invest in either a decent scanner or an SCPC receiver.

As to the aforementioned FM^2, outboard stereo processors and translators needed for such reception are about $300. One reader reports that he gets excellent FM^2 reception with his Yupiteru scanner. From my point of view, the programming available on such services isn't worth investing in.

The Choice Is Yours

It's hard to know what your interests in a particular hobby will be until you've been into it for a while. Plan as much for the future as you can while not being able to see very far at all. It's important to avoid paying twice for the same thing. If you are just getting into the TVRO hobby here are my recommendations:

1. The antenna is the heart of your system. Buy the biggest and the best dish you can afford. Collect information on C/Ku antennas. Pay attention to "Gain" usually expressed in "dB". A quality 10 foot dish will have a gain of 40 dB.
2. Buy the lowest noise temperature LNB you can afford. For C-band using the above dish, 40 degrees is fine; for Ku 1.0 dB is fine. Stay away from hyped-up claims of super strong LNBs.
3. Buy a C/Ku feedhorn, even if you don't have the money to buy a Ku band LNB. In the future you may find a cheap Ku LNB, and Ku activity may increase as well. Just be sure to put duct tape over the hole where the Ku LNB would go to keep moisture from the feedhorn.
4. Buy a 24 inch actuator motor if you can't afford a horizon-to-horizon mount. If you want to experiment with viewing Intelsats, reprogram your receiver and move the actuator arm clamp up so that the farthest west the dish can move (fully withdrawn) will be Spacenet 4 (101° W). This means that your 24 inch actuator can push the dish at least 37 degrees further east (fully extended) than it would if it were properly set up to receive as far west as Satcom F1.

   Technically, you should be able to see as far as 32 degrees east—certainly as far as Panamsat. This will allow you to experiment with your system, and you will get a taste of what the Intelsat birds are all about. This procedure will likely take hours, but you will learn more about how your system works and you'll be able to see just how good your dish performs under marginal reception conditions.

   Chaparral makes a dielectric insert (about $15) which installs in the feedhorn throat and converts linear to circular polarization. While not as effective as a real circular feedhorn it will be better than watching on a linear feedhorn.

   A word of caution to fiberglass dish owners: the motor may not be strong enough to return the dish to its proper location. You may have to be out at the dish giving a manual boost. Be very careful to avoid injury when working with a heavy, moving dish.
5. Don't be afraid to buy a used receiver. Satellite receivers evolve at a much faster pace than that of antennas. The design life of receivers is about two years, as opposed to ten for most antennas. Consequently, dealers often have a supply of used receivers in their back rooms. Buy from a reputable dealer, get a 90 day warranty, and look for brands the dealer still carries.
6. Buying a used SCPC receiver is virtually unheard of. Sure, I've had people tell me they bought a commercial SCPC receiver for $10 at a hamfest from a guy who had no idea what it was. You're not likely to be that lucky. Try the cheap'n'easy method described above, or look for a used scanner that is capable of being used as an SCPC receiver.

Above All, Experiment!

This is a hobby. When these satellites were designed and launched, their creators had no idea that one day they would be viewed by ordinary people. The TVRO industry is a proud example of free enterprise chaos at its best. Read everything you can about this hobby, put in the cheapest system you can, but above all experiment! At least once a week "surf" the hundreds of video channels and keep a note pad handy. You'll have to jot down the interesting things as you go along, otherwise you'll never remember half of what you see! It's truly amazing.

NOTES

DC Block—Blocks DC current from entering your receiver
LNB—Low Noise Block Downconverter
SCPC—Single Channel Per Carrier
TVRO—Television Receive-Only

Kevin Carey, WB2QMY

You Tell Us...

By tradition, the New Year is a time when we set some new goals for ourselves. Why not include a few radio goals on your list such as trying out a new mode or exploring a new band? If longwave adventure is on your list, you've found the right place for tuning tips and information!

Information exchange is what this column is all about—the sharing of tips and ideas on all sorts of longwave topics. This month, the mailbag is chock full, so I'm letting the readers write most of the column. Here's what's happening in radio's Basement Band:

Down Under

Terry Krey (TX) is still at it. He is continuing his exploration of the sub-basement below 150 kHz. Terry specializes in this part of the spectrum and enjoys looking for new stations or changes in activity. Lately, he says he's been hearing strong signals from RTTY stations NSS (134.9 kHz), NPM (146.1 kHz), NAA (24 kHz), and NLK (24.8 kHz).

Terry stresses that the key to identifying sub-basement stations is an accurate frequency listing and a well-calibrated tuning dial. Rarely are two VLF stations assigned to the same frequency, so you can be sure of which one you're hearing by carefully "zero-beating" the station's carrier, then consulting a frequency chart. One of Terry's favorite LF references is the Grove *Shortwave Directory*.

Logging In

Al Hemmalin (RI) has gone from being a longwave newcomer to a "DX hound" in just a few short months. I received almost six pages of loggings that Al has compiled into a computer database format, some of which are included in Table 1. One catch he is rightfully proud of is LML (430 kHz) in Lomalinda, Colombia. To catch this station and the others on his list, he used a Drake R8 receiver and an LF Engineering L-400 Active Antenna mounted about 20 feet above the ground.

Jim Osborn (VA) has also checked in with a fine list of beacons heard. He notes that conditions were especially good during the fall at his location, providing him with some excellent DXing results. Jim uses a Sangean ATS-803A portable receiver along with its built-in ferrite rod antenna.

As you can see from his list, it doesn't take lots of fancy equipment to pull in the big ones, just some patience and a bit of tuning skill. One thing to remember when using a ferrite antenna is that they are very directional. It's wise to scan the band with the radio in one position, and then spin the cabinet a quarter turn and try again. You might be surprised at the new signals you'll hear the second time through. If man-made noise is a problem, however, your best bet is to orient the set for minimum interference and leave it in that position.

On the West Coast, **Peter Warncke** (CA) has been busy logging new stations below 500 kHz. He has come across one unidentified station: YXL (346 kHz), which he has heard on two different occasions. My records show that this new beacon is located at Sioux Lookout, Ontario—an excellent catch from the West Coast.

Peter also notes that he's heard eight coastal marine beacons near his location. The days are numbered for many of these sites as the Coast Guard is shutting down most marine beacons that will not support the Differential GPS (DGPS) system.

TABLE 1

Beacon Loggings

FREQ.	ID	LOCATION	BY
235	9H	Camp David, PQ	A.H. (RI)
294	CL	Ft. Macon, NC	J.O. (VA)
296	G	Galveston, TX	P.W. (CA)
307	R	Snug Harbor, ONT	J.O. (VA)
311	BFE	Brownfield, TX	P.W. (CA)
328	YTL	Big Trout Lk, ONT	A.H. (RI)
330	CMZ	Cozumel, MEX	A.H. (RI)
341	JHN	Johnson, KS	P.W. (CA)
344	YGV	Harve St. Pierre, PQ	A.H. (RI)
344	POY	Powell, WY	P.W. (CA)
347	SBX	Shelby, MT	P.W. (CA)
353	LLX	Lyndonville, VT	A.H. (RI)
356	PB	W. Palm Beach, FL	A.H. (RI)
362	SB	Sudbury, ONT	J.O. (VA)
363	RNB	Miliville, NJ	J.O. (VA)
368	L	Toronto, ONT	J.O. (VA)
385	HYX	Saginaw, MI	A.H. (RI)
390	JT	Stephanville, NFLD	A.H. (RI)
391	DDP	San Juan, PR	J.O. (VA)
396	ZBB	S. Bimini, BAH	A.H. (RI)
415	ASJ	Ahoskie, NC	J.O. (VA)
416	BKL	Cleveland, OH	A.H. (RI)
428	COG	Orange, VA	A.H. (RI)
516	YWA	Petawawa, ONT	A.H. (RI)
523	JJH	Johnstown, NY	A.H. (RI

This month's loggings are courtesy of: Al Hemmalin (RI), Jim Osborn (VA) and Peter Warncke (CA).

Information Please

Stephen Andrews (GA) wrote in with two excellent questions regarding resource publications for longwave listening. He asks: 1) "Who has the best LF beacon guide and how can one be obtained?" and, 2) "Is there a definitive list of non-beacon stations below 540 kHz, particularly one which includes coast and ship information?"

In my opinion, it's tough to beat the *Aero/Marine Beacon Guide* for information on beacons. It lists over 7000 of them and contains a handy cross reference to help you find a beacon even if you only know the frequency or callsign. There are lots of tips for QSLing, too. The *Guide* is available for $15.00 postpaid from: Mr. Ken Stryker, 2856-G, West Touhy Ave., Chicago, IL 60645.

As for question #2, yes, there are guides available which list non-beacon stations on the longwaves. For the latest information, I recommend Bob Grove's *Shortwave Directory* (8th Edition). Marine & Coastal frequencies are covered on Pages M-30 and M-31.

Incidentally, the *SW Directory* also includes a useful longwave directory which lists hundreds of beacons and other utility users by their frequency. The *Shortwave Directory* ($29.95 including binder, $24.95 without binder) is available from Grove Enterprises, 300 South Hwy 64 West, Brasstown, NC 28902-0098.

Does Anyone Know?

Al Clark (N2EUW) has been getting back into longwave after many years of being on the sidelines. He's brushed off an old Sonar Model 1301 DF (direction finding) radio which covers 100 kHz to 3.5 MHz, as well as a weather channel. (Sounds like the perfect radio for the LW/Broadcast band DXer!) Al does have one request. He would like to obtain an operator's manual for the

Bill Bowers (OK) sent this fine photo of his longwave shack.

Sonar, and wonders if anyone might have information on obtaining one. If you can help out, drop me a line here at *MT* and I'll send your information along to him.

Al's letter points up the usefulness of DFing equipment for recreational longwave use. Thanks to GPS, these units are starting to show up at flea markets and hamfests for very reasonable prices (usually under $100). Boaters who used to depend on beacon receivers are now switching to more precise (but far more expensive) GPS receivers.

The nice thing about old DF equipment is that it tends to be quite sensitive and selective, perhaps because it was designed specifically for the LF/MF band. Most also contain a large signal strength meter and a DF antenna that is built right in. Is there anyone else out there using DF equipment? What tricks can you pass along?

Still Going

Charles Bernth (NY) says he's been hooked on beacon hunting since he read the October 1993 "Below 500 kHz" column. Over a year, and 240 beacons later, he is still hearing new signals. In mid September, Charles logged seven new beacons in the New England region—an area he usually doesn't hear too much from. He's hoping the trend continues throughout the winter season.

Charles would like to start QSLing beacons and has designed a simple Prepared Form Card (PFC) to send out to the beacon engineers. He found some excellent tips for QSLing aero beacons in Ken Stryker's guide, but would also like to get addressing information for Coast Guard beacons.

Marine beacon reports should be sent to the Coast Guard office closest to the beacon in question. To request a list of addresses for all of the Coast Guard districts, write to: The United States Coast Guard, Washington, DC 20590.

That wraps up another month. Here's wishing you the very best longwave DX in 1995!

BEYOND THE BASICS

If you could see the radio waves in the air around you, you'd find them to be all different lengths depending on the frequency of operation. As frequency decreases, the wavelength increases. What's really surprising, is just how long radio waves get once you drop below 500 kHz. Table 2 shows how the longwave bands stack up against the higher frequencies.

TABLE 2: *WAVELENGTH COMPARISONS*

OPERATING FREQUENCY	APPROXIMATE WAVELENGTH
VHF HI BAND (155 MHz)	6'
FM BROADCAST (98 MHz)	10'
SHORTWAVE BROADCAST (11 MHz)	89'
SHORTWAVE BROADCAST (7.3 MHz)	135'
AM BROADCAST BAND (1 MHz)	984'
UPPER LONGWAVE BAND (500 kHz)	1968'(.4 Mile)
LONGWAVE MID-BAND (250 kHz)	3936'(.75 Mile)
1750 METER "LOWFER" BAND	5754' (I+ Mile)
LONGWAVE LOW END	98,400(10 kHz)(19 Miles!)
"NATURAL RADIO" RESEARCH	984,000(1 kHz)(186 Miles!)

Ike Kerschner, N31K

Ring Out the Old

Let's hope that 94 was the bottom year for the low end of the current sunspot cycle. While not as terrible as it could have been, there was not a whole lot of DX to be had on the bands above 20 meters. General opinion is that 1995 should see a slow upswing in sunspot numbers; with luck we will crawl out of the bottom of the barrel in a year or two. 80, 40, 30 and 20 meters will continue to be the most active bands in 95.

Check it Out

It is a good idea to check WWV at 18 minutes past the hour for solar activity reports. And, by all means, give the bands above 20 a careful look on a frequent basis. I have often been pleasantly surprised to find open 15 meters (which I check regularly) when no one else was around, resulting in good long rag chews with several rare DX stations. If you don't look, you won't know what you are missing!

Try calling CQ if you do not hear any activity—it could just be someone else is lurking on the side lines listening. (If we're *all* listening, we won't hear anyone, right?)

Another hint on checking out the frequencies above 14 MHz is to tune the utility (nonbroadcast) frequencies. Utilities use state of the art propagation prediction systems and know on an hour by hour basis which bands will be useful to them. Checking a utility station guide that lists frequencies and modes is the best means of identifying the stations you hear, so you'll know what part of the globe is coming through.

One additional hint is to check the propagation predictions in *MT, CQ* and *QST* magazines. I am partial to the *CQ* predictions; W3ASK, George Jacobs, has been doing the column for many years and seems to have an extremely good handle on when to check the various bands for openings. I might add that George writes it in plain language and explains things in a manner that is easy for newcomers to comprehend.

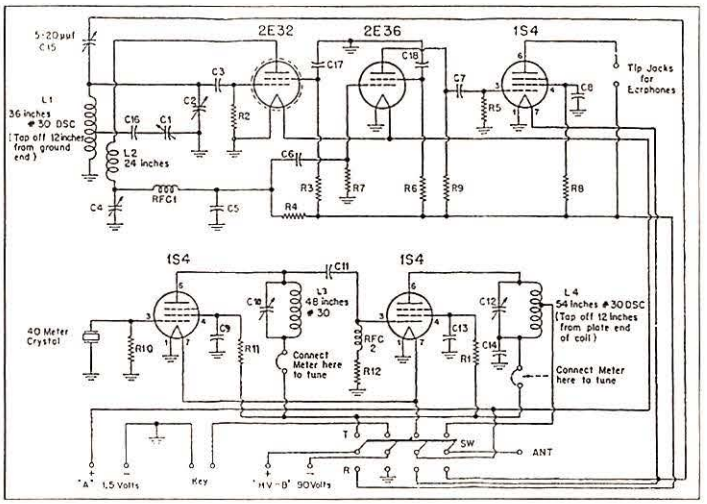
Make a Resolution for 1995

Nothing makes ham radio (or any other pursuit) more interesting than setting a goal and working at it. For example you might decide this is the year you are going to make WAS (Worked All States) or upgrade your license to the next level.

Most of us become a bit jaded doing the same old thing day in, day out; so set a goal in a different area. If you are a rag chewer, resolve to get into a contest or two and see how you like it, or stop chasing DX on 20 and see what DX can be worked on six or two meters.

An activity that is not only fun but extremely rewarding is giving your time to help someone else get started in hamming (be an Elmer). As the saying goes, "variety is the spice of life"!

Figure 1: *Regenerative Receiver (See next page for details)*



New Videos

Daily we see more new videos on ham radio coming into the market. Last month I described a new video from *CQ* magazine called "Ham Radio Horizons." Two recent additions to the *CQ* video library are "Getting Started in Contesting" and "Getting Started in Packet Radio."

"Getting Started in Contesting" describes what a ham radio contest is, how they work, and how you can participate. While aimed at the newcomer, the old timer will find a lot to interest him in this video. Contesters' language and terms are explained so the novice can "at last" understand what they are talking about.

Several high power contest stations are shown and multi-operator operation is described in some detail. But the most interesting aspect of this program is that it shows you that you do not need a multi-kilowatt station to participate, have fun, or win a contest.

The whole gamut of contesting is explored from HF to microwaves. The video will whet the appetite of the budding contester and provides enough information to get him started.

"Getting Started in Packet Radio" describes packet radio in fairly easy terms. All aspects of packet are looked at, but due to the complex nature of packet, only the surface of the hobby is introduced in this video. The non-packet user will definitely come away with a basic understanding of this aspect of ham radio. The video will not make you a packet expert (nor did the publishers expect it to); however, you will be able to make some judgments about packet and decide if it is something you are interested in. The only real way to understand packet, as the producer says, is to buy a TNC and try it.

Both videos are available at a price of $19.95 plus $4.00 S&H from *CQ* Communications Inc, 76 North Broadway, Hicksville, NY 11801-9962 or phone 1-800-853-9797 and use your credit card.

K7HMP

Dave Williams wrote a nice letter after reading about my little one-watt tube rig in the June issue. Dave described his own activities in the 1950's and sent an interesting diagram and article about a complete 1950's mini rig.

The rig is a complete regenerative receiver and simple transmitter using miniature tubes (you will really need to scan the flea market for these). Dave's enclosed schematic is pretty well self-explanatory except on how to wind the coils. According to the article he sent, the coils L1, L3, and L4 are scramble-wound on the end of the builder's little finger, and tied with thread to help them hold their shape. L2 is wound on a lead pencil, slipped off, and also tied to keep its shape. L2 slides inside of L1. Seems the only thing critical is to note the length of wire, as noted in Dave's diagram.

TABLE 1

Parts for 1950-Era Mini-Rig

R1,6,8 & 11 ..... 4.7K
R2 ..... 1Meg
R3 ..... 1K
R4,9 ..... 10K
R5 ..... 470K
R7 ..... 270K
R10 ..... 47K
R12 ..... 22K all 1/2 watt.
C1,10,12 & 15 .. 20pf trimmers
C3,5 & 11 ..... 100pf disk
C2 & 4 ..... 50pf trimmers
C6,7,8,9,13,14, 17 & 18 ..... .005uf disc.
RFC 1 & 2 ..... It calls for 3mh chokes, but the more standard 2.5mh will work well.
The antenna should be 130 feet of wire end fed

Coils are wound with 30-gauge double silk-covered wire (try 30 gauge enamel). See Table 1 for parts and Figure 1 for schematic.

If you build this little rig, do let me know how it worked out for you.

Columns Past

Some of the most popular "On The Ham Band" columns have been on radio control and on building your own station, with nostalgia radio running a close third. Consequently, we are going to do more of the same this year.

I am always looking for ideas, so write and ask for what you want to see in this column. If you have photos or schematics of older gear, please send a copy to me via *MT*, PO Box 98, Brasstown, NC 28902.

That's all for Jan; best wishes to all for a happy and prosperous New Year.
73 de Ike, N3IK

Rob Leonard's Ham DX Tips

Happy New Year to everyone! As Ike says, a new year brings new DX goals, such as trying to log new countries (possibly on a new band) for a specific award or just for the fun of it. The following tips just might help you in those goals.

CAMEROON TJ1JR meets with his QSL manager N7VEW (Adam Boettiger, 6911 Naches Height Rd., Yakima, WA 98908) every Wednesday starting at 2230 UTC on 14165 kHz SSB. **CANADA** VE1XA, Roy Blakeburn, *Monitoring Times* reader and contributor to this column, wrote to say that he is active from Cape Breton Island (IOTA reference NA-010) as follows: OMISS Net on 14290 kHz SSB at 1700 UTC and 3940 kHz SSB at 0100 UTC, and at various times on the IOTA frequencies of 14160, 14260, and 21260 kHz SSB, and in the following nets: 14226.5 kHz SSB, The Butterfly Net; 14247 kHz SSB; and the YL ISS net on 14325 kHz SSB. Roy will reply 100% to valid QSL requests (please enclose an SASE or an SAE with return postage). His address: 13 Blackett's Lake Road, Sydney, NS B1L 1B9 Canada. **CANARY ISLANDS** EA8BYR is on 24940 kHz SSB when propagation is good for 12 meters at 1630 UTC daily. His QSL manager is WA1ECA, Frank J. Dlugokinsky, P.O. Box 772, Litchfield, CT 06795. **CUBA** CO2KK, Radio Habana Cuba's Arnie Coro (who can be reached at Box 1, Habana, 10100, Cuba) will be active this month 1820 to 1840 kHz SSB and CW looking for contacts. **DJIBOUTI** J28JJ offers his country to the growing number of RTTY DXers active on the bands these days. Look for him on 14087 kHz starting at 2030 UTC. QSL's should be sent to F6HGO Marc Lebon, 1 Rue de Tonkin, F-69100 Villeurbanne, France. **HAITI** HH1D and HH1T are missionaries in the mountains near Thomonde. Using solar charged batteries, they are active daily on 7288 kHz at 1000 UTC, and at 2200 UTC they are active between 14260 and 14350 kHz SSB. The route for QSL requests will be given by them on the air. **SOUTH SHETLAND ISLANDS** SP2GOW, Andy Grotha, is the resident amateur at the Polish Antarctic research base here. Andy is using the callsign HF0POL, which is the base's club station, and has been wanting to become active on RTTY for some time. Now, thanks to the International RTTY Association, he soon should be! They have donated a Hal Telereader to the club station, and it hopefully will be in place some time this month. Look for HF0POL between 14085 and 14095 kHz RTTY, after Andy gets the equipment and has it up and running. **TOGO** 5V7MD meets his QSL manager N7VEW (for his address see the listing under Cameroon above) Thursdays at 2200 UTC on 14165 kHz SSB. **TONGA** A35CT (who is Craig S. Thompson, Box 2990, Nukualofa, Tonga) is on 28475 kHz SSB when ten meters has propagation starting at 2200 UTC.

Remember, your contributions to this and the other *MT* columns are always appreciated, and thanks to all who sent in material last year! I hope that the New Year is a safe one for each and every one of you, loaded with plenty of happiness and good DX! 73 de Rob N9LAG

George Zeller

FOIA Reveals Cuban Clandestine Busted Twice

In response to a Freedom of Information Act request by *MT* reader Ulis Fleming of Glen Burnie, MD, FCC Field Operations Bureau Beverly Baker has revealed that **Frente Nacional Cubano** has been busted *twice* by the FCC. In the November "Outer Limits" we covered a July 27 bust of this anti-Castro clandestine at the Hacienda Las Carolinas ranch of Domingo Sadurni in the Penuelas barrio of the town of Salinas, Puerto Rico. Baker now says that the station had previously been busted at a location in Miami, Florida.

According to the FCC, Frente Nacional Cubano was busted on December 1, 1993, at a house owned by Ralph Santa-Cruz in southwestern Miami. Santa-Cruz received a FCC Notice of Apparent Liability on February 28, 1994. He was fined $8,000 for the incident.

Interestingly, Santa-Cruz' station was not physically inspected by the FCC until December 2. In its report on the incident, the FCC says, "There is reason to believe that Mr. Santa-Cruz changed the equipment being used and sent the original transmitter and power amplifier to Puerto Rico."

As we reported in the November issue, the Frente Nacional Cubano transmitter was not confiscated during the July 1994 Puerto Rican bust. It now is clear that this was a second offense. This is curious.

The FCC outlines a sequence of events in the Puerto Rican bust. The Cuban government filed a complaint on March 22 about the station. The FCC assigned the case to its San Juan / Santa Isabel office on March 23. A map of Puerto Rico reveals that the Hacienda transmitter site is about two or three miles from Santa Isabel. But, it took the FCC more than four months to locate the transmitter. This is also curious.

These curious circumstances have led some DXers to speculate that the FCC treated the two busts in an unusual fashion because of Domingo Sadurni's membership on the board of trustees of the very powerful Cuban American National Foundation, headed by Jorge Mas Canosa. There is no proof of this, of course, but it is food for thought.

Pirates Invade 43 Meters

On October 29, High Adventures Ministry's **KVOH** California transmitter signed on with a regular evening schedule on 7415 kHz. This longtime pirate frequency joins a list of many others on 41 meters that are now occupied by powerful international broadcasting stations in the evening. Although pirates have still been using 41 meters, especially during daylight hours, the presence of powerful interference from the big broadcasters has caused the pirates to move.

Captain Crook's Long awaited WJLR QSL.

Quite a few pirates have chosen to operate *below* the 41 meter ham band. Frequencies within 10 kHz of 6965 kHz have been particularly popular for several hours after 2300 UTC on the weekends. This area of 43 meters has seen occasional use by pirates over the years, but the number of stations who have moved down here has very substantially increased in recent weeks.

At the 1994 *Monitoring Times* convention, I was asked repeatedly about good frequencies to check while searching for pirates. It now is clear that 6965 kHz is a good one to store in your receiver's memory banks.

Clandestine Logs from Russia

Stan, the announcer and verie signer at Russian pirate **Radio Magic,** sends some clandestine loggings direct to *Monitoring Times*. He notes the **Voice of Kashmir Freedom** on 4100 kHz for an hour at 1530 UTC, the **Voice of Worker** on 4190 kHz on 4190 for an hour at 1700 UTC, the **Voice of Rebellious Iraq** on 7070 kHz for 150 minutes at 1500 UTC, and the **Voice of Iranian Kurdistan** on 4290 kHz for 90 minutes at 1630 UTC.

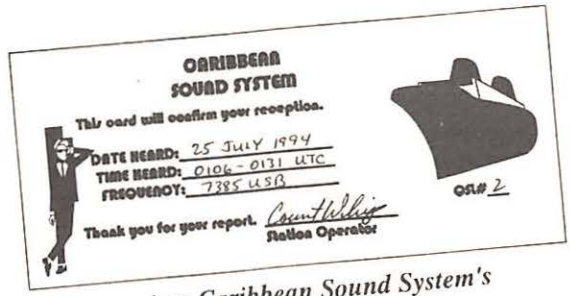
These intercepts should be of interest to our European readers. But, these times are local daylight hours in North America. Since 4 MHz frequencies will not propagate overseas during periods of sunlight, it's virtually certain that we won't be able to hear these broadcasts.

On the Europirate scene, Stan points out that **Radio Without Borders International** reactivated during the summer "on 76 meters." This would also be a tough catch for DXers in the Western Hemisphere.

Other Clandestine Items

- Ulis Fleming notes that **La Voz del CID,** which has used a frequency within 200 Hz of 9941.6 for years, now frequently moves to 9920 kHz in the evening. They announce the shift before moving, presumably in an attempt to avoid loud Cuban whine jamming on their traditional spot.
- Ulis was one of the first to notice that **Radio Caiman** has disappeared in the evening. It held out on a daily basis on 9965 kHz for years with its anti-Castro programming. Kirk Trummel of Springfield, MO, reports that he occasionally hears Caiman in the morning around 1100 UTC, but the station's activity has been drastically curtailed. Can any of our readers confirm Kirk's recent logs of Caiman? Many have suspected that this mysterious station, about which little is known, may have some relationship with USA intelligence agencies.
- I ran across a nostalgic item in the August 23 issue of the *Salem News* (Ohio) *Yesteryears* historical magazine. They pointed out

that the May 19, 1950, edition of this newspaper reported that Mildred E. Gillars, the "Axis Sally" voice on German World War II clandestines, was sentenced to 10 to 30 years in prison and fined $10,000. Obviously, clandestine broadcasting had serious consequences 50 years ago!



Ruger receives Caribbean Sound System's second QSL.

Pirate News

Jeff White of **WRMI,** who was in attendance at the *Monitoring Times* convention, confirmed that he offers airtime to pirate stations on licensed station **Radio Copan** on 15675 kHz in Honduras. Jeff says that he has had some inquiries (especially from Europirates) about his offer to sell airtime to pirate stations, but so far no station has actually scheduled a broadcast. Anyone with an interest in this novel idea should contact Jeff at PO Box 526952, Miami, Florida 33152.

We also hear direct from Derek Taylor, who publishes a detailed *Alternative Pirate Medium Wave News* newsletter, as well as some lengthy Europirate station and address lists. If you would like information on Derek's material, send $1 US for postage to him at 12 Dorman Road, Preston PR2 6AS, England.

Radio Free Berkeley

Stephen Dunifer, longtime operator of low power FM pirate Radio Free Berkeley in the California Bay Area, has received notice that the FCC intends to seek a court injunction that would prohibit additional broadcasts by the station. The FCC previously issued a Notice of Apparent liability against Dunifer, fining him $20,000 for alleged illegal broadcasts.

In a press release, Dunifer said, "They can kiss my bill of rights." Attorneys for the station said that the FCC action was unprecedented, given that temporary restraining order injunctions are normally sought for "emergency situations where the threat of immediate and irreparable harm requires the intervention of the Court." A December 2 hearing in Federal District Court in Oakland was scheduled on the FCC request, but the hearing missed the deadline for this column. Stay tuned.

Interviewed by *Monitoring Times*, Dunifer pointed out that although the FCC refuses to license low power community stations with transmitters under 100 watts, it routinely licenses very low power translator relay stations for licensed broadcasters, and maintains regulations that hams and other services should use the lowest feasible power during transmissions. He and his attorneys argue that the FCC's behavior is inconsistent and unconstitutional.

What We Are Hearing

Your pirate radio intercepts are always welcome for this column, c/o PO Box 98, Brasstown, North Carolina 28902. Maildrop addresses used by North American pirate stations reported by our readers this month include PO Box 452, Wellsville, New York 14895; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 146, Stoneham, MA 02180; PO Box 17534, Atlanta, GA 30616; and PO Box 1461, Perm 614036, Russia.

Anti-Witch- 6666.6 at 2145. One of the stranger Halloween seasonal stations this year was this new operation, which featured plenty of eerie sound effects. There was some controversy about the precise ID, given a heavy echo in the announcer's voice, but my tape clearly translates "Anti-Witch is Calling." Addr: None. (Zeller)

Down East Radio- 7414 at 2315. Oscar Guggins relays comedy tapes from an announced location in Maine. Addr: Blue Ridge Summit. (James Laughlan, Youngstown, NY; Randy Ruger, Brandon, FL)

Hit Parade Radio- 6964 at 0015. Dale Dorman normally programs rock oldies in a 1960's AM hit music format, but on Halloween he played the top ten Halloween songs as voted on by pirate listeners. Addr: Wellsville. (Gigi Lytle, Lubbock, TX)

KDED- 7445 at 0300. This one uses a slogan as the Voice of the Grateful Dead. You don't need to be a rocket scientist to figure out what musical selections are featured. Addr: Wellsville. (Harold Frodge, Midland, MI)

Microdot Radio- 7415 at 2345. This relatively new operation appears to mainly feature a classic rock and comedy format. Addr: Faribault. (Laughlan)

North American Pirate Radio Service- 7413 at 2300. Richard T. Pistek has relayed dozens of pirates for the last couple of years. On his anniversary show he played highlights from all of them. Harold says that his QSL came via Stoneham. Addr: Wellsville. (Barry Williams, Enterprise, AL; Ruger, Frodge)

Pan Global Wireless- 7380 at 0100. Mike Oxlong generally mixes comedy and amusing parody ads on his pirate station. Addr: Wellsville. (Frodge)

Radio Airplane- 6960 at 0100. Captain Eddy still transmits from his airplane. On Halloween he teamed up with the formerly late Nemesis of **Radio Doomsday** with a slogan of "Radio Scareplane." Addr: Wellsville. (Ruger)

Radio 43- 6960 at 0015. This relatively new station often programs old time radio rebroadcasts. A recent one featured a sketch about a radio astronomer who searches for broadcast transmissions from alien civilizations. Addr: None, but accepts reports via the Free Radio Network computer BBS at (417) 624-1809. (Zeller)

Radio Azteca- 7414 at 2300. Bram Stoker's hilarious parody of DXing and DXers is always a real treat. Rob recently received their 124th QSL. Addr: Wellsville. (Robert Ross, London, Ontario)

Radio Cyclops- Our readers and the station operator report that many QSL's have arrived in mailboxes everywhere from this station. We pictured their nice card in September. Addr: Wellsville. (Ross, Frodge)

Radio Dr. Tim- 7412 at 2315. Several Europirate stations have established relay relationships with North American transmitters, just like international broadcasters have done for years. This is one of them. Addr: Wuppertal. (Frodge)

Radio Free Euphoria- 7375 at 0045. Captain Ganja's clever marijuana advocacy format is entertaining, whether or not you agree with his politics. Sometimes the station has identified itself as **High Times Radio.** Addr: Wellsville. (Frodge)

Radio Magic- 5750 at 0300. Stan, who sent us some clandestine loggings this month, is the force behind this Russian pirate. Their North American relay is normally **NAPRS.** Addr: Perm. (Dick Pearce, Brattleboro, VT)

RBCN- 3450 at 0330. Radio Bob rules the roost at one of the funniest stations on shortwave radio today. Randy heard the station plugging the *Monitoring Times* convention. Addr: Atlanta. (Ruger)

Solid Rock Radio- 7470 at 1430. Dr. Love played Chicago rock music on the morning that Jesse heard them, but he often dabbles in soul and other musical styles. Addr: Wellsville. (Jesse Rose, Hampton, VA, Ruger)

(unidentified)- 6912 at 0345. William heard this singing male pirate that we mentioned in last month's column. In addition to French, this strange but very active net also uses another unidentified language. We can use your help on this one! Addr: None. (Hassig)

Up Against the Wall Radio- 7415 at 1915. Easily identifiable by its loud "oogah" horn interval signal, this one recreates a musical and political mood from the late 1960's and early 1970's. Owsley, their announcer, requires program comments for QSL's of listener reception reports. Addr: Wellsville. (Williams)

Witch City Radio- 7445 at 0000. This veteran Halloween station returned from Salem, MA, during the holiday. Addr: Wellsville. (Max Syko, Gaylord, MI)

WJLR- Captain Crook of John Lennon Radio says that his long delayed QSL's should be in the mail by now, using the station logo that we picture this month. Addr: Blue Ridge Summit. (Direct from the station)

WKND- 7415 at 1800. Radio Animal is back at the controls with his rock music and pirate radio "K-9 Dog" discussion format. He sometimes has in-studio guests such as A. J. Michaels of **Action Radio.** Addr: Blue Ridge Summit. (Frodge)

WLBG- 7450 at 0200. Mr. Microphone at "We Love Bob Grove" is another pirate that has plugged the *Monitoring Times* convention, mentioning Grove Enterprises' 90% off sale. Funny, Bob never told *me* about this sale! Addr: Unknown. (Ruger)

WHAT'S NEW?

BOOK REVIEWS AND NEW PRODUCTS

by Larry Miller

Guest reviewer: Bob Grove

Going Scouting

Every scanner user has one ultimate goal: getting the frequency. Until recently, the only way to find a frequency in use was to search for it—an often laborious and time consuming process. Now, Optoelectronics, Incorporated, of Fort Lauderdale, Florida, has announced a new product that may very well be the answer to every scanner user's ultimate dream.

The Scout is "the first hand held device intended solely to detect radio transmitters in the near field." It's not a frequency counter, nor a measurement/calibration unit. The Scout is a frequency recorder which can automatically detect and record up to 200 frequencies and 250 repeat hits on any previously detected frequencies.

Ideally suited for security, surveillance, law enforcement, or scanner users, the Scout is pocket-sized and operates from a NiCad battery pack which provides over six hours of continuous operation. Slip this unit into your pocket, attach the separately available DB32 antenna and you're all set to go hunting. The unit will detect and record any active frequencies it senses and will signal with either a pager-style vibration in Walk-By Mode or a beep in Drive-By Mode.

Best of all, the Scout can download its recorded frequencies into a computer database through an available computer interface. If you're using an OS456 equipped PRO2005/6 or OS235 equipped PRO-2035, R-7000, or R7100, the Scout can be connected and the scanner tuned to each recorded frequency using Recall Mode.

The Scout Model 25 comes with an AC adapter charger, 3.5" disk with PC compatible utilities and an operator's manual for the retail price of $399. However, it can be found for less at dealers such as Grove Enterprises and others.

The DB32 miniature VHF/UHF antenna is $29 and the CX12 TTL to RS232C interface is $89. The Scout is manufactured by Optoelectronics, Inc., 305-771-2050 (5821 NE 14th Ave. Ft. Lauderdale, FL 33334).

Analyze Your RF

Forget the cumbersome calculations jotted on scraps of paper while you're perched on a rooftop clutching coax and feedline, trying to adjust for the right impedance and SWR. Why not do it the '90's way and use Autek Research's RF Analyst?

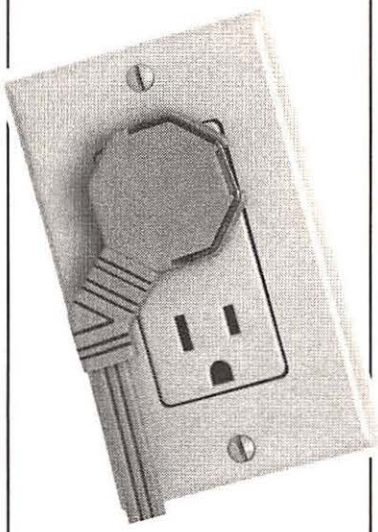
Pocket-sized, the digital RF1 makes construction, measurement, and adjustment of everything from antennas, transmission lines, tuners and RF networks in the 1.2 to 35 MHz range a snap. The device connects to any antenna or feedline and instantly shows impedance and SWR.

The miniature internal transmitter notes resonant frequencies, allowing for easy trimming of antennas. Feedline loss and phasing, Q, tuned- circuit resonance and many other antenna and tuner parameters can be measured.

The RF Analyst measures 4.5 x 2.5 x 1.5 inches and runs on a standard 9V battery for 12 hours of use. It's available from Autek Research, 4143 W. Waters Avenue, #120, Tampa, FL 33614 or 813-871-3805. The RF1 retails for $129.95 plus $6 shipping and handling.

No More Fat Plugs

American Leviton Wire and Cable Group knows how it is to have several power cords connected to a wall socket. They know that the average plug measures at least 2-1/2" out from the wall, forcing an unsightly and space-taking gap. They know, and they've done something about it.



Billed as the latest innovation in electrical safety and design, the FlatPlug is an ultra-thin 1/4" wide and comes with a fold-down safety grip ring. The cord and plug sits flat against the wall socket, allowing furniture, office equipment, and appliances to be pushed in closer to the wall surface. The FlatPlug's unique design also reduces the hazard to infants and children.

Available in stock or custom 2C polarized or 3C grounded styles, the FlatPlug can be ordered from American Leviton Wire and Cable Group, 36 Freeman Street, P.O. Box 880, Pawtucket, RI 02862-0880. Call 401-726-0070 for pricing information.

Scanning: The Next Generation

The inception of computer interfaces like the OptoScan 456 for the Radio Shack PRO-2005/6 scanners has changed the face of scanning. No longer does a user sit in front of a scanner punching at the scan button and writing down obscure frequencies. Frequencies are now logged using the power of a computer to do the work.

As if things weren't easy enough, DataFile, Incorporated, of St. Louis, Missouri, has arrived on the scene with a software release called Probe. Designed to be used exclusively with the OptoScan 456 interface, Probe utilizes a "true database engine" which enables it work with large capacity frequency data such as the PerCon FCC database.

Providing user-friendly menus and commands, you can scan thousands of frequencies in a matter of minutes without having to enter long lists of frequency data. Probe pulls service name, city, state, callsign, type, even latitude and longitude data for each frequency. It even reads, decodes and squelches for CTCSS and DCS tone coded frequencies.

Probe requires a PRO-2005/6 scanner, Optoelectronics OptoScan 456 scanner/computer interface, IBM compatible computer using MS/PC DOS v3.0 or higher, 640K RAM, hard disk, serial port and optional IBM/Epson printer.

With too many features to list, suffice it to say that Probe is a welcome and highly usable addition to computer aided scanning, allowing maximum scanning and information display. Probe software is priced at $99.95 plus $7.50

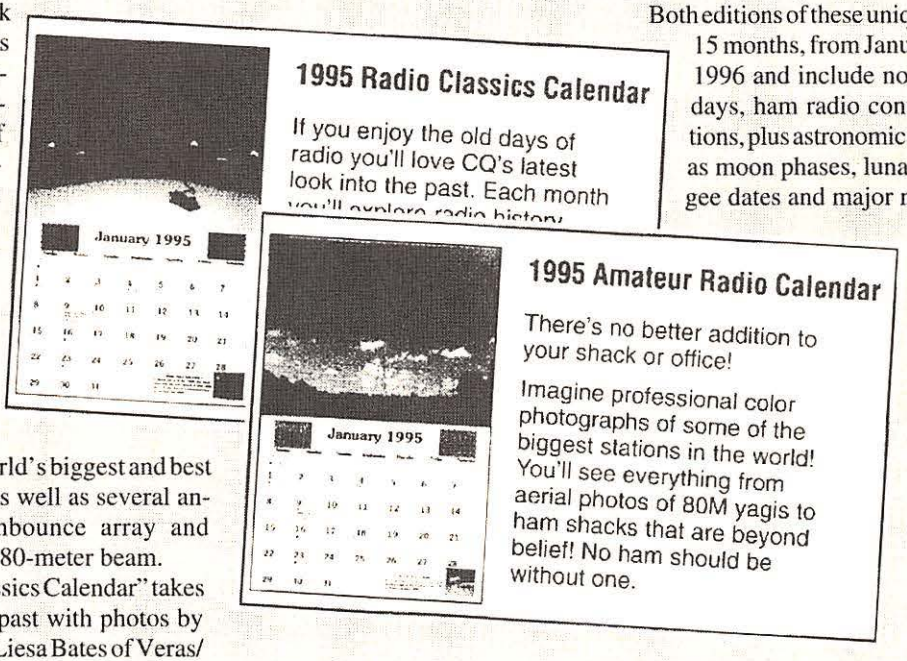
Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 300 S. Hwy 64 West, Brasstown, NC 289202.

Ham Calendars from CQ

Like an accurate clock, an accurate calendar is a must for your shack wall. Real radio enthusiasts know better than to ruin the aesthetics of their shack with pictures of animals or mountain scenery. Instead, real radio enthusiasts pick up a copy of one of CQ Communications' popular ham radio calendars.

The "CQ Amateur Radio Calendar" features photographs by *CQ* staff photographer Larry Mulvehill, WB2ZPI. Larry's color photos include shots of some of the world's biggest and best known ham stations, as well as several antenna farms, a moonbounce array and N6DX's mountaintop 80-meter beam.

The "CQ Radio Classics Calendar" takes you back into radio's past with photos by Joe Veras, N4QB, and Liesa Bates of Veras/Bates Photography. Each month features a touch of nostalgia with antique radios, tubes, microphones and code keys.



Both editions of these unique calendars cover 15 months, from January 1995 to March 1996 and include notes on major holidays, ham radio contests, and conventions, plus astronomical information such as moon phases, lunar apogee and perigee dates and major meteor showers.

CQ Calendars retail for $9.95 plus $2 shipping and handling and can be ordered from many ham outlets, or directly from *CQ* at 76 North Broadway, Hicksville, NY 11801 or call 1-800-853-9797.

shipping and handling (MO residents add 5.975% sales tax) and is available from DataFile, Inc., P.O. Box 20111, St. Louis, MO 63123.

R-390 Repair

Some of the best radios are some of the oldest. Unfortunately, as the state of the art moves forward, older radios are left behind. Still usable, many of these units cannot be repaired, as servicing simply doesn't exist anymore.

Miltronix of Toledo, Ohio, specializes in the repair and restoration of R-390 and R-390A receivers. Whether you're in need of module repair and alignment or a complete remanufacture, Miltronix can do the job.

According to the company, a typical repair consists of "checking all tubes, checking the mechanical synchronization, troubleshooting and alignment from scratch which normally bring all radios back to good working order." The cost for this service is $150, plus $5 per bad tube and $10 for rectifiers. There is no charge for small resistors and capacitors and no advance payment is required.

The company also offers remanufacture, which consists of "total disassembly of the entire radio, wash of all modules and mainframe, removal of slugs, RF and IF transformers from RF section, wash and degrease geartrain, replace broken gear clamps, relubricate, reassemble, check tubes, clean and replace defective controls" and even re-silkscreen the front panel lettering. How's that for service?

The cost of a reman is $250 plus $5 per bad tube and $10 for rectifiers. Major parts are priced at market value.

All work is preceded by a phoned estimate and turnaround time depends on the number of sets on the bench before yours. Contact Miltronix at P.O. Box 3541, Toledo, Ohio 43608 and tell them we sent you!

Low and Medium Frequency Scrap Book

Authoritative publications on VLF experimentation are hard to find; maybe it's because everyone defers to Ken Cornell, whose writings for decades on the subject of low frequency experimentation have become the standard.

Ken Cornell's *Low and Medium Frequency Scrap Book* grows a little bigger each year (now nearly 100 pages in its 9th edition), and dozens of antenna, transmitter, test equipment, filter and receiver projects for radio's basement band, the first megahertz or so of spectrum now abound.

This year's edition contains a welcome addition: earthquake monitoring, now a serious avenue of study for "lowfers," as low frequency experimenters often refer to themselves.

Another "black art"—coil construction and winding—is also covered in great detail. Lists of hard-to-find parts sources are included: Fascinating reading for the inveterate tinkerer.

Order the new, 9th edition from the author, Ken Cornell, 225 Baltimore Avenue, Point Pleasant Beach, NJ 08742; it's only $17.50 including shipping.
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AM Radio Log

The National Radio Club is back with the latest edition of their *AM Radio Log*. NRC has been publishing this fine listing annually for fifteen years and, as always, the information is accurate and indispensable. Three-hole punched and shipped in a loose-leaf format, the *AM Radio Log* lists nearly 5,700 AM radio stations in the United States and Canada.

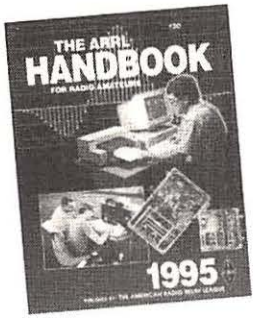
Each station listing is comprised of location, frequency, call letters, format, news network, station address, station slogan, day and night transmitter power. The rear of the book contains cross references by city and by call letters for easy and quick discovery of just who you've DXed.

Clear and concise, NRC's *AM Radio Log* belongs on your shelf. The 1995 edition sells for $19.95 in the US and $20.95 in Canada, from NRC Publications, P.O. Box 164, Mannsville, NY 13661-0164.

ARRL Handbook for Amateurs 1995 Edition

Each year we await with breathless anticipation the latest edition of this missal; this year's edition, the 72nd, is certainly no disappointment. Rather than a revision, the 1995 publication is an entire rewrite.

New experts have joined the ranks of the *Handbook*'s authors, emphasizing the growing trend toward digital communications. A wealth of new projects enable experimenters to build a wide

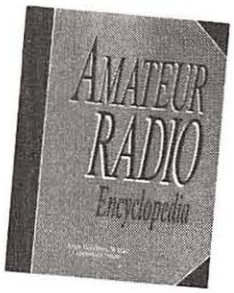


array of equipment from simple test instruments through major transceivers.

No other technical book maintains the quality of excellence, the abundance of information and the affordable price of the *ARRL Handbook*.

This newest edition of the *ARRL Handbook* is widely available from from *MT* advertisers, including Grove Enterprises, for $29.95.
- bg

Amateur Radio Encyclopedia



Old timers should recognize the byline of this widely-published electronics engineer; Stan Gibilisco, W1GV, has been writing authoritative articles and books for the amateur radio enthusiast for decades, and he knows his stuff. Now Gibilisco shares his wealth of knowledge in the pages of this new volume, some 600 pages of illustrated discussions in easy-to-understand language.

What is reactance? What constitutes loss? How does a ferrite rod antenna work? How do you read a Smith chart? What produces a solar flare? What do we mean by magnetic flux?

Thousands of terms and hundreds of illustrations are at your fingertips in this handy reference. *Amateur Radio Encylopedia* is $29.95 plus shipping from TAB Books, a Division of McGraw-Hill. To place your order call customer service toll-free at 800-722-4726.
- bg

Scanners 3

Before you ask where Scanners 1 and 2 are, let me explain to you that we Americans aren't the only ones who like to tune into the airwaves. Listeners across the ocean in the UK fight persistent and restrictive laws to monitor their radios and a new book by the late Peter Rouse helps them along.

Scanners 3: A Complete Update is the fourth edition of a book that continues to be the most comprehensive scanner guide ever published in Britain. Fully illustrated, this 271-page book is a smart and well-written introduction to the art of scanning.

Included are photos and technical information for the latest scanners available, plus frequency listings and British bandplans from 25-2000 MHz. For the first time, HF shortwave information has been included.

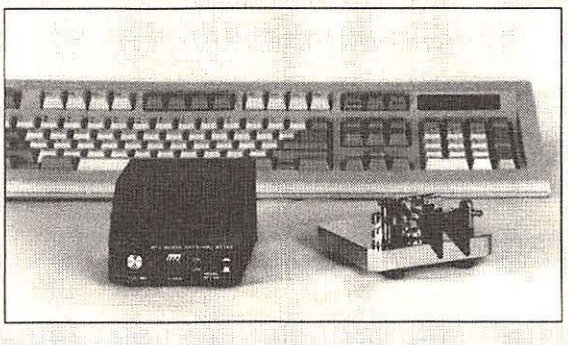
If you're new to scanning in the UK or just need a good refresher, *Scanners 3* is it. Plan on visiting Britain? Take this book along for maximum scanning pleasure. It's available from Argus Books, Boundary Way, Hemel Hempstead HP2 7ST and retails at L9.95. US residents, call for exchange rates: (0442) 66551.

Tuning ACARS

There was a time when a pilot used a radio not only to talk with Air Traffic Control, but to relay routine company messages, too. That time is fast coming to a close. Today's pilot, with his heavy cockpit workload, now uses ACARS (Aviation Communications Addressing and Reporting System) to quickly transmit those standard operational messages.

For scanner users equipped with decoders such as the Universal M-400 or M1200, ACARS messages present a brand new monitoring possibility. Understanding the message bursts as

Super CW Keyboard



Having trouble learning Code? Or, maybe you just don't have the time to study. The old-timers did it the right way, learning Morse Code dit by dah, but today things are easier. In fact, MFJ Enterprises, Incorporated, has just made it a downright breeze.

The MFJ-452 Super CW Keyboard with "Perpetual Memory" gives the Code-sender a way to send perfect sounding CW right from the keyboard. The unit has a two-line LCD display and RFI suppressed keyboard, plus eight 250 character nonvolatile message memories, a 150 character type-ahead buffer, an iambic keyer and a "Morse Code Trainer."

Make no mistake, there's no computer involved here. The MFJ-452's AT101 compatible keyboard plugs into a compact interface that includes a speaker, sidetone, volume control and jack for external speaker or earphones. The LCD display simultaneously shows you what you're typing and what you're sending out. Review stored messages, keyboards settings and spot typing errors immediately. SingleTouch function keys allow simple recall and storage and commonly used prosigns can be created by Alt and character keys. You never had it so easy!

Order your MFJ-452 with keyboard for $129.95 or the MFJ-452X without keyboard for $99.95. Contact MFJ Enterprises, P.O. Box 494, Mississippi State, MS 39762 or phone 601-323-5869.

they scroll across the M-400 or 1200 screen, however, is another story entirely.

Ed Flynn's new book *Understanding ACARS* takes all the sweat and bewilderment out of the process. Not only does Ed explain the ACARS system components, but he decodes the operating modes and details the message types and abbreviations you're likely to encounter during a monitoring session. The information is presented clearly and in a logical manner designed to ease your transition to this new form of communications. Settle down with your receiver and this book and before long you'll know the ACARS system better than a TWA captain.

Understanding ACARS is 79 pages, softbound and is available for $6.95 from Universal Radio Research, 6830 Americana Parkway, Reynoldsburg, Ohio 43068 or call 800-431-3939.

Digital Video

Let's face it: we live in a digital world. If you're still running on analog time, you'd better hurry to catch up. Early digital broadcasting and production equipment was large, expensive and operated by trained professionals. But, time and technology has brought the state of the digital video art down to the level of the non-professional.

Author John Watkinson's new book *Introduction to Digital Video* is the perfect introductory text designed to take the beginner through the basics and theory, right up to current practices. John keeps the mathematics to a minimum, while still covering this subject in a comprehensive and usable manner.

Contents include an introduction to digital video, conversion, digital processing, digital coding principles, digital video interfaces, introduction to the digital VTR, non-linear video editing and a glossary. The 310-page *Introduction to Digital Video* is $34.95 from Focal Press, 313 Washington Street, Newton, MA 02158-1626 or call 800-366-2665.

Police Call 1995

The largest-selling scanner frequency directory, edited by Gene Hughes, is now available in its newest edition, this year adding a glossary of public safety terminology. Frequency lists are prepared alphabetically by public safety agency and frequency, with additional lists of US government, railroad and aircraft frequencies.

Highly useful as well is the consolidated frequency listing which shows agency use by frequency throughout the VHF/UHF communications spectrum.

Sold by geographical region, *Police Call* is available from Radio Shack stores nationwide and from Grove Enterprises ($9.95 plus shipping).

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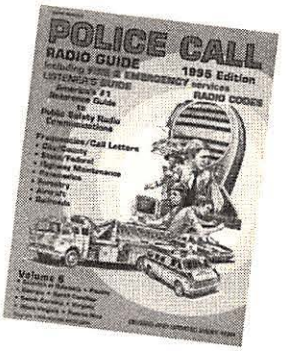


Bob Parnass, AJ9S

The Radio Shack PRO-2035 Scanner

How Does It Compare With the PRO-2006?

Radio Shack recently discontinued the PRO-2006, perhaps the best base/mobile scanner radio ever sold, and replaced it with the 1000 channel PRO-2035. Bob Grove reviewed the PRO-2035 in October in this column, and Bill Cheek examines its inside assembly this month on page 108. But, many readers have asked, how does it stack up against the PRO-2006?

Physical

The PRO-2035 is about 5/8" wider and 1/2" taller than the PRO-2006. Extra room in the spacious cabinet will interest experimenters and companies who may provide aftermarket accessories for the PRO-2035.

The dark plastic case has rounded corners, typical of contemporary "European" stying. Squelch and volume knobs, each with a hairline marker groove, are the same dark color as the front panel, making it hard to see where they are set. (Tip: a little white correction fluid in the grooves provides a contrasting color.)

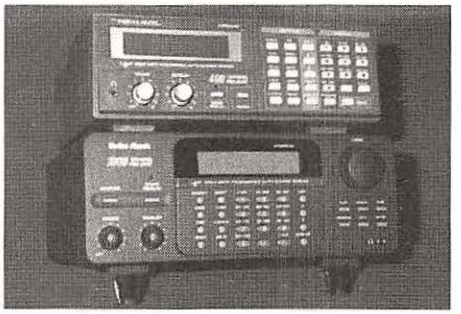
Although there is a jack for running the PRO-2035 from a 12 VDC source, Radio Shack refers to this model as a "home scanner."

Frequency Coverage

There is a typographical error on page 3 of the owner's manual which specifies that the PR0-2035 tunes the 470 - 805.750 MHz range. Coverage in this band actually stops at 520 MHz and resumes at 760 MHz. The PRO-2035 tested for this article tuned 25 - 520, 760 - 823.995, 849.005 - 868.995, and 894.005 - 1300 MHz.

Memory Features

The PRO-2006 has 400 conventional memory channels and 10 Monitor channels backed up by an ordinary 9 volt battery. The PRO-2035 has 1000 conventional memory channels and 100 Monitor channels backed up by a special 3 volt battery soldered onto the main circuit board. The owner's manual states memory contents will be retained for up to three months in the event of a power interruption.



The PRO-2035 (bottom) and PRO-2006

Both the PRO-2006 and PRO-2035 have 10 pairs of search limits, but the PRO-2006 permitted searching only one range at a time. The PRO-2035 is more flexible and allows "linking" search ranges together sequentially. You can set search range #1 limits to 46.61 - 46.97 MHz and search range #2 to 49.61 - 49.97 MHz, for example. The PRO-2035 will alternate searching both ranges. (Tip: If your favorite search range has one or two birdies, or frequencies you want to skip, break it up into two or more search ranges and link them together.)

Not only are there a lot more channels in the PRO-2035, but several new ways to manipulate them. By pressing a few keys, you can:

1) zero all 100 memories in any single bank
2) zero all 1000 memories in all banks
3) zero all the locked out memories in any bank
4) display the number of "empty" channels in any bank. (The PRO-2035 owner's manual refers to memories which contain 0.0000 as "empty" memories.)
5) move all the nonempty channels in a bank downwards to fill in the empty channels in the bank
6) transfer multiple Monitor channels into one or more banks
7) transfer all the channels in any bank into the Monitor channels

With so many channels, the PRO-2035 needs another feature, but it's missing: it should skip over empty channels automatically. Although the PRO-2035 scans twice as fast as the PRO-2006, it still wastes time scanning empty channels unless they are locked out. The bulk move operations listed above clear the lockout on each destination channel. Owners will certainly grow weary of pressing the LOCKOUT and MANUAL keys for each empty channel.

There are 10 banks of 100 channels each. Bank 1 is for channels 1-100, bank 2 for 101-200, and so forth. This is more difficult to use than the numbering convention employed in the ICOM R-7100, where bank 0 is for channels 0-99, bank 1 for channels 100-199, etc. With ICOM's numbering system, you can easily tell what bank a channel is in by its first digit, e.g., that channel 650 is in bank 6. In the PRO-2035, channel 650 is in bank 7, and that's confusing. All that aside, a better scheme would be to have more banks and fewer channels per bank, say 50 banks of 20 channels, or even user definable banks, because a bank of 100 channels is really too large for sensible programming.

Almost 20 years ago, the Electra/Bearcat BC-250 incorporated a fantastic new feature termed "search and store." One could program a pair of frequency limits, start an automatic search, and store all active frequencies into a special scratchpad memory. The active frequencies could later be recalled and programmed into regular memory channels. Electra's scheme was elegant—smart enough to store each active frequency once and only once. What's more, one could store unwanted frequencies, e.g., birdies and paging frequencies, into the scratchpad and they would be skipped during conventional searches. Today's ICOM R-7100 receiver boasts a similar feature.

Scanner hobbyists were hoping Radio Shack would offer a search and store feature in its next premium scanner, and it did—sort of. The PRO-2035 has an Auto Store mode which stores active frequencies found during a search into one or more conventional memory banks. Once all the empty channels are filled, the PRO-2035 emits a series of beeps and stops searching. There is a separate pair of frequency limits for Auto Store so you

won't use up one of the 10 pairs mentioned earlier.

What a pity the Auto Store implementation is not all it could be. You cannot use it to skip unwanted frequencies. Worse, it will store the same frequencies over and over again into empty memory channels. Let's say you program the PRO-2035 auto store limits to search between 407 and 419 MHz, and specify that active frequencies will be stored in bank 4. You start the search and let it run while you run some errands, hoping that while you are away, the PRO-2035 will be catching dozens of interesting federal frequencies.

Upon returning, you find the PRO-2035 snared a busy Veteran's Administration hospital paging system and stored the same frequency in 30 channels! That's just what happened during the evaluation. Even with its limitations, the Auto Store mode is beneficial, and a few new frequencies were found while using it.

The tests which follow were performed by switching an outdoor Antenna Specialists AV-801 antenna back and forth between a PRO-2006 and the PRO-2035.

Sensitivity

Spot checks were made to compare sensitivity by listening to the same weak signals on both scanners. Both radios were similarly sensitive except in three instances: the PRO-2035 was slightly more sensitive at 147 and 852 MHz and noticeably more sensitive at 460 MHz. This could be splitting hairs, as my 10 year old Electra/Bearcat BC-300—an old design optimized for four bands—beat both Radio Shack models in the sensitivity department.

Dynamic Range

The PRO-2035 and PRO-2006 are high end models, and people who buy them are more apt to connect them to outdoor antennas. Therefore, it's important that they perform well in strong signal environments.

Perhaps the biggest performance difference between the PRO-2006 and our PRO-2035 became apparent when listening to weak signals in the presence of a strong station transmitting on another frequency. The PRO-2006 has much better dynamic range than the reviewer's PRO-2035.

Using the PRO-2035, a moderately strong signal from the 460.525 MHz sheriff's repeater 10 miles distant wiped out weaker signals on frequencies 50 kHz in either direction, and produced hiss on weak signals 100 kHz away. The desense phenomenon was a problem in the 155 MHz band, too.

The tests were run again with both a PRO-2005 and the PRO-2006. Neither was desensitized by the moderately strong signals.

Images and Spurious Responses

The PRO-2004/5/6 series, the portable PRO-43, and the PRO-2035 use "up conversion," but the PRO-2035's 609.005 - 613.5 MHz first IF (intermediate frequency) is 2 MHz higher than the earlier models. We speculate the change was made to avoid interference problems which bothered some owners of the earlier scanners who lived near a channel 20 television transmitter. The TV signal mixed with one of the local oscillators and generated a third signal near 48.5 MHz, the 2nd IF, causing interference on several frequencies.

Although up conversion affords improved image rejection, triple conversion and frequency synthesis circuitry are complicated and several images were heard, especially on the PRO-2035. Table 1 shows several examples.

TABLE 1: *Images Heard on PRO-2035*

PRO-2035 tuned to *(Image)*	Transmitted frequency *(Actual)*	Difference
159.515	931.5125	771.9975
146.075	904.075	758.000
1105.550	870.450	235.100
1114.840	893.160	221.680

New Features

The new tuning knob has a light feel but is a welcome feature nonetheless. A look inside the PRO-2035 revealed the tuning knob is connected to a special switch assembly rather than an optical chopper, or photo interrupter, used in higher price radios and computer mice.

The knob can be operated as a channel selector or as a VFO control. We discovered a technique, not mentioned in the owner's manual, which lets one enter a frequency and tune around without actually storing the frequency. To tune around 154.6 MHz, for example,

1) press MANUAL (if not already in the manual mode)
2) press 154.6
3) press TUNE
4) rotate the knob in either direction to begin tuning

If you have never used a scanner with a tuning knob, you will be pleasantly surprised how handy it is to be able to tune around using a knob instead of fighting with the up and down keys as on the PRO-2006. For example, while putting the PRO-2035 through its paces, the tuning knob was used in the VFO mode to chase down and identify a spurious paging signal—a "spur"—which was drifting up and down the 2 meter ham band, causing serious interference to three repeaters. The PRO-2006 was virtually useless in this application.

Other Considerations

The PRO-2035 specifications state 50 channels per second as the fastest scanning speed. Our PRO-2035 scanned slightly faster than 50 channels per second in a bank loaded entirely with 800 MHz NFM frequencies, and slowed to 40 channels per second in a bank purposely loaded with a mixture of frequencies in different bands and modes.

Some scanner buffs refuse to use the priority feature on their radios because priority sampling tends to "chop up" transmissions on nonpriority channels. The priority feature in the PRO-2035 is well behaved in this regard, and one can hardly tell it's enabled.

While the squelch on the reviewer's PRO-2035 had an acceptable amount of hysteresis, some users may wish to reduce it. That is, decrease the amount of "play" in the squelch control. One could lessen the hysteresis by replacing the tiny 100K ohm surface mount resistor between pins 12 and 14 of IC-2 (a TK10420), with a 220K or 330K ohm resistor.

Wine gets better with age. That's not true with the EL (electroluminescent) panel used to backlight the displays in the PRO-2004, PRO-2005, and PRO-2006. The EL panel grows dim as it is used. To prolong its life, GRE replaced the dimmer switch in later production PRO-2006s with a switch to turn off the back light.

Instead of an EL panel, the new PRO-2035 utilizes LEDs (light emitting diodes) to illuminate the display, and that's an improvement. Unless overdriven, LEDs will work reliably for a very long time.

Summary

Being at the top of the Radio Shack scanner line, we expect a lot from from the PRO-2035. Its tuning knob and memory manipulation features are significant advantages over the PRO-2006. The discontinued PRO-2006 exhibited better dynamic range and fewer images and remains an excellent performer.

The PRO-2035 is a very good scanner. With a few changes, it could be a great scanner.

Lawrence Magne
Editor-in-Chief
Passport to World Band Radio

• AOR's New AR3030 Tabletop Receiver
• Which is the New-Version Sony ICF-SW77?

If you're growing weary of hearing about tabletop and shortwave receivers with four-digit price tags, take heart. In addition to the existing $600-800 "value" offerings from Drake, Lowe and Yaesu, there's now a new model from the Japanese firm of AOR, which for years has been known and respected by scanner aficionados.

The AOR '3030 offers AM, synchronous AM, USB, LSB, CW, fax and NFM coverage from 30 kHz to 30 MHz. This receiver packs a lot of performance into a package that is relatively small (9-3/4" x 10-3/4" x 3-3/4") and light (4.8 pounds). Power is supplied by an external UL-approved 12 VDC transformer that is packed with the receiver. Alternatively, it will run off eight "AA" cells for 30-45 minutes or so. An illuminated LCD displays the frequency and status of the receiver. One of two optional VHF converters may also be installed.

The face of the receiver is divided horizontally across its midline by a metal bar. Above that bar and to the right of the display are nine buttons to select VFO (there are two VFOs), bandwidth, AGC, scanning, tone, attenuation, memory access (there are 100 non-tunable memories that store frequency, mode, AGC status, attenuation, tone, bandwidth, BFO status, and tuning step), memory storage, and memory bypass during scanning.

Below the "midline stripe" is a tuning knob—possibly the smallest to be found on a tabletop model. It is stiff, with no flywheel effect, and has a small, non-rotating "speed" dimple. Tuning steps are user-selectable via a novel scheme employing the MHz and kHz buttons. (The '3030 tunes in 5 Hz increments, displays in 10 Hz increments.) There are just four other knobs for volume, BFO pitch, RF gain and squelch, and none of these is concentric—an ergonomic plus, as humans don't have concentric fingers.

Fifteen buttons manage frequency entry, including a setup for entering any of 22 shortwave-broadcasting and amateur-radio bands. Each of these buttons is of reasonable size and decently spaced, and clicks when fully depressed. The numeric keypad is yet another non-standard configuration: a 3 x 3 setup, with the "1" at upper left, and the zero offset to the right of the "9." Fortunately, the software is relatively friendly. To enter 5975 kHz, just press 5, 9, 7, 5, and kHz, and it's done.

Modes are selected carousel-fashion by two buttons at the left of the display. But here, AOR has shown some innovative thinking. First, the two buttons allow the listener to move forward or backward through the mode selection list. As a result, to get from AM to AM Synchronous and back again can be accomplished in twinkling of an eye. Likewise, moving to and fro through LSB, USB and CW is readily done.

Getting from AM to any sideband mode, though, requires a bit of a journey. To make it easy to tell, at a glance, which mode you're in, the '3030 is equipped with various colored LEDs that glow above the printed name of the mode that's activated.

AOR has come to the rescue of anyone who ever wanted to store a frequency but couldn't remember which memory presets have been used and which have not. Just press the "M.In" key, and the receiver automatically displays the number of the lowest unused memory preset. Then it's your choice—you can then either press ENT/BS to accept the memory location that the receiver has selected or enter the number of a memory preset that you would prefer to use and then ENT/BS to store the information. Having to press ENT/BS adds a step to the process, but it sure beats having to go on a "grand tour" of the memory presets.

The back of the '3030 has connectors for both wire and coax-fed antennas. But—surprise!—the coax connector is a BNC type, and the listener must supply an adaptor for hooking up to PL-259-equipped antennas. A BNC-to-PL-259 adaptor (part number 278-120) will likely be available at most Radio Shack stores.

A questionable feature of the '3030 is the tilt bail. Designed to prop the receiver at a more useful angle for tabletop operation, it refuses to stay locked, causing the front of the receiver to keep crashing down on the table.

The performance of the '3030 is a mixed bag. Sensitivity varies from superb-to-excellent at 10 MHz, but drops to only fair at 2 MHz. It's excellent at 1 MHz, and good at 260 kHz. At 9 MHz, we found outstanding sensitivity that, combined with the receiver's only fair dynamic range (when measured at 5 kHz spacing), produces overloading. In most other measurements of receiver performance, however, the '3030 earns an excellent rating.

In addition to lower sensitivity in the tropical bands, DXers will also note the absence of signal-tweaking controls, such as a notch

filter and passband tuning, that serious signal hunters love. It is the absence of these features, more than anything else, that accounts for the '3030's relatively affordable price.

The '3030 has two bandwidths, nominally 6 kHz and 2.4 kHz, and both show excellent ultimate rejection. The wide—using a Collins mechanical filter—actually measures 5.4 kHz at -6 dB, and has an excellent shape factor. The stock Murata narrow filter measures 2.5 kHz at -6 dB with a superb shape factor. This filter can be replaced with an optional 2.5 kHz Collins filter, but there is no need. In addition, there is another slot for an optional CW bandwidth filter.

The '3030 has a synchronous detector which helps to tame distortion from selective fading and adds to the enjoyment of hour-after-hour listening. Unfortunately, this synchronous detector works with double sideband only, so listeners cannot choose between the upper and lower sideband to reduce adjacent-channel interference. This is notwithstanding that you can get sideband-selectable synchronous detection in a $230 Sony portable.

In addition, the '3030's synchronous detector demands careful tuning to center frequency, producing considerable distortion in the presence of a powerful station if it isn't. Otherwise, it does a respectable job of maintaining lock.

The '3030 generally shines in audio quality. The highest level of distortion measured is 3%, among the lower audio frequencies in the AM mode. Most other measurements in the AM or AM-synchronous modes were 2% or below, an excellent showing. In single sideband, the highest measurement of distortion was under 0.5%. (One of our panelists—a lifelong professional monitor—was very much taken with the single-sideband performance of this receiver.) In short, the '3030 ought to be enjoyable for long hours of listening.

Unfortunately, all that great audio does not show its best coming out the small, front-firing speaker. Headphones or an external speaker are needed for optimum results.

The AOR AR3030 is a likable receiver. At $799.95, it offers generally pleasant results for program listening for at least $200 less than world band supersets. This makes it worthy choice alongside the various offerings from other manufacturers in and just under that price point.

Will the Real ICF-SW77 Please Stand Up?

In the 1995 *Passport*, a reader's observations were printed concerning various ways one can tell the original from the subsequent versions of the Sony ICF-SW77. As several readers have figured out, these differences were based on color publicity photographs from Sony. In reality, as opposed to the photos, the only visible difference that exists between the original and subsequent versions is that the telescopic antenna on the subsequent versions has 11, rather than nine, elements.

Why would Sony's photographs differ from the actual radios sold? According to a spokesperson from Sony, some photographs Sony used for publicity were of mock-up "dummies," rather than real radios, and thus differed in various respects from what was actually offered for sale.

Ergo, look for the version with 11 elements in the telescopic antenna. In practice, however, the older version has virtually disappeared from dealer shelves, especially from shortwave-specialty firms, which have high turnover.

This equipment review is performed independently by Lawrence Magne and his colleagues in accordance with the policies and procedures of International Broadcasting Services, Ltd. It is completely independent of the policies of Grove Enterprises, Inc., its advertisers and affiliated organizations.

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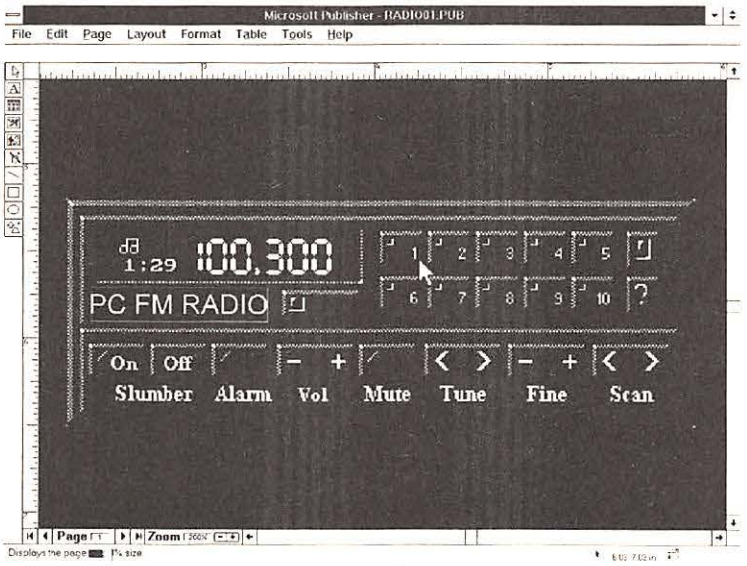
John Catalano, PhD

A Win-Win Gift Exchange

(One bad shirt and tie combo for a computer controlled FM radio receiver)

Last time we met we discussed the unfortunate situation where a well-meaning family member or friend, spends his money on a gift for you. Not knowing exactly what you would like, and being on a limited budget, the predictable result is not exactly something you would use or even care to own. A real lose-lose. They have put out their money and you have to find room in your closet for yet another ugly shirt and tie.

Last month we looked at two inexpensive radio related accessories for your computer—possible gift alternatives equal to, or less than the price of a shirt and tie. This month we'll finish the list.



Psst.. Mister. How About a $55 Computer-Controlled FM Radio Card?

Could it be? Yup, it is. The PC FM Radio Card is here. This is a complete FM radio on a PC expansion card the size of a serial/parallel I/O card. The printed circuit board is fairly well made and uses surface mounted components. The heart of the receiver is a Philips' integrated circuit. The concept of the design is based on medium to high end portable and sound system receivers which tune via an on-board, dedicated processor. In most cases this device controls the LED or LCD display as well.

Now, imagine yanking out the processor and the display circuitry and replacing its function(s) with a PC. "A bit of over-kill," do I hear you say? Like killing an ant with an atomic bomb? Not really. We'll speak more about that later.

Required Basics

You'll need a 286, 1Meg of RAM, DOS 3.3 (or Windows 3.1) and either stereo speakers or headphones as the minimum system configuration. Although all the commands are available from the keyboard a mouse makes things easier. With its short size, PC FM Radio card plugs into any PC expansion slot on the motherboard. On the slide bracket where you would usually find I/O or video connectors are the radio's only connections to the outside world—two miniature audio jacks. One is for an included folded dipole 300 ohm antenna, and the other is for Audio Out. The output will drive an 8 ohm speaker to a room-filling volume.

Control Software — Double Value

Software for both DOS and Windows 3.1 is included with the card, and installation is very simple and quick via a menu driven program.

From DOS, run the FM Radio program and you will have a computer controlled FM radio which covers the commercial band 88-108 MHz. See Figure One. Volume, mute, tune, fine tune, scan and programming/recall of 10 preset frequencies are some of the functions of FM Radio Card. In addition, an alarm function is available which will sound an alarm at a user programmed time. To me it has the look and operational feel of a Lexus or Acura car stereo system.

The region at the upper left is where all operational information is displayed. Here, current time, the memory "button" that is selected, alarm set indication, and the frequency being monitored can be found. Also the word "TUNE" appears in this region. Although not really a tuning indicator, it only appears when you are not tuned to the center frequency of a station, but off frequency by a bit.

By using the "SCAN" buttons you can let the receiver scan up or down from your current frequency. The scanning will stop once a station is encountered (at least in theory). Via a combination of keystrokes, or mouse clicks, 10 frequencies can be stored and recalled by clicking on the corresponding numbered button or hitting that number key.

What About this Ant and Atomic Bomb Stuff?

I know what you are thinking, "I'm not going to tie up a whole PC AT by listening to an FM radio." Well, you don't have to. PC FM Radio can be run in a DOS TSR (Terminate and Stay Resident) mode. You can go do your spreadsheet or word processor *while* listening to FM radio.

Tuning to another station while in this mode can be accomplished via a number of, shall we say, interesting keystrokes. In the Windows version of the software performing any function is just a matter of clicking the desired function area on the picture of the radio. Minimizing the PC FM Radio screen allows you to run other Windows programs while you listen to Golden Oldies or Grunge. (Bad music filters are not available!)

Operational Comments and Observations

The sensitivity of the model I tested was excellent, even with the 300 ohm antenna hanging behind the computer. I used Walkman type headphones, an 8 ohm five-inch speaker,

and an amplified speaker; all had good audio quality. Come on! $55 for a computer controlled FM radio and DOS and Windows software?!

I was equally pleasantly surprised with the DOS version—once you set the frequency and volume, you can leave the program and start a spreadsheet or whatever, while listening to your favorite FM station. This is done with the escape key which brings up the small box shown at the top left of Figure One. Then the software allows you to control the radio via a combination of keystrokes which required a finger contortionist to perform quickly. I found these confusing and difficult to remember. Using the Windows version was far easier.

Due to the computer generated RFI (radio frequency interference) hash, the scan function was almost useless when using the included antenna. The scan stopped on every one of the many RFI signals. When an outdoor 75 ohm coax fed Radio Shack FM antenna was used, three RFI signals were heard. This made scanning much more usable.

For those of you with a sound card, the output of the PC FM Radio Card can be connected to the input of the sound card. Using my Soundblaster Pro and two-way stereo speakers gave the best fidelity of any combination.

Still Daydreaming

Even with a winner, I'd like to see more. To start with, the potential exists for expanded software capabilities, such as a database of USA FM stations. Although ten pre-set "buttons" are provided, there should be no reason why fifty, or one hundred couldn't exist. As NASA said during the delay of the first space shuttle launch, "The problem is only software." Talk about understatement.

Operationally, a small card with all the keystroke commands would be nice to tuck under the keyboard. Of course this could be home made from the instruction sheet, or the help file which comes with PC FM Radio. But a cheat sheet summary version of it would be handy.

Overall, for the price and performance, PC FM Radio Card is a real winner. I found it a useful, relatively low cost addition to my computers and radio equipment.

The offshore manufacturer's suggested retail price is $50, plus $3.00 shipping and handling. By special arrangement with one U.S. dealer, Radio Accessories, *MT* readers can get it for $50 and free shipping in the USA. PC FM Radio is available by check or money order from Radio Accessories, P.O. Box 168, Melvin Village, NH, 03850.

"Tie-ing" it up

Well, there you have it: Three useful computer-radio accessories ideas. The CD-ROMS started at $5, averaging around the $14 mark. The SWL Manager, receiver control and database, came in at around $20. And PC FM Radio Card rings in at $55. (See last month's column for details of prices and suppliers.)

The gifts at the low end are just the thing for your kids to get you for birthdays or holidays, and watch you use and enjoy instead of burying in a closet. And at the higher end, they are candidates for gifts from rich old Aunt Millie and Uncle Everett. They all qualify as good "treat yourself, you've worked for it" purchases without having to mortgaging the house, car or kids.

Next month we will look at how well a simple, inexpensive cure for some of the computer generated interference works in practice. By the way—anybody want to buy some beautifully colored flowered ties and matching shirts?

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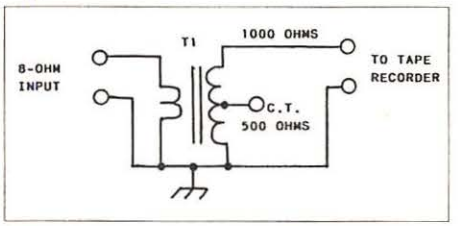
Doug Demaw, W1FB

Tape Recorder Interfacing

There are many choice signals that appear in our headphones or speakers during the course of monitoring the radio spectrum. Some of the signals we hear are elusive, and we may never capture them again. I like to preserve some of this material on audio tape for reference later on, or to simply share my "catch" with friends who drop in to visit.

However, obtaining quality tape recordings from our radios is not always as easy as it may seem, especially when a microphone is held in front of a speaker. This often produces a tinny sounding reproduction that has lost much of the fidelity contained in the original signal. For this reason I prefer to "hard wire" my tape deck to the radio I use for monitoring. This article describes various ways to interface your tape recorder to a receiver at minimum cost and without circuit complexity.

Figure 1



Simple transformer coupling between an 8-ohm receiver output and a 600-ohm tape recorder input. See text for details

Simple Transformer Coupling

Most radios are designed for an 8-ohm audio-output impedance. On the other hand, the input impedance of the run-of-the-mill tape recorder is between 600 and 1000 ohms. Therefore, direct coupling to an 8-ohm speaker jack results in degraded audio quality and a loss of audio power because of the impedance mismatch. Maximum power transfer (audio or RF energy) occurs only when unlike impedances are matched.

Perhaps the simplest technique for matching the unlike impedances of the radio and the recorder is the one shown in Figure 1. T1 is a miniature audio transformer that has an 8-ohm secondary and a 1000 ohm center-tapped primary. One half of the primary may be used to provide an 8- to 500-ohm transformation, or all of the primary winding can be used to match 8 ohms to a 1000-ohm load. Use whichever arrangement that provides the best audio reproduction.

A transformer of this type can be purchased from Mouser Electronics[1] for approximately $2. You can save some money by using the output transformer from a junked transistor radio. Be sure to use shielded audio cable between the T1 primary winding and the input jack of the recorder. This will prevent unwanted hum pickup.

FET Impedance Transformer

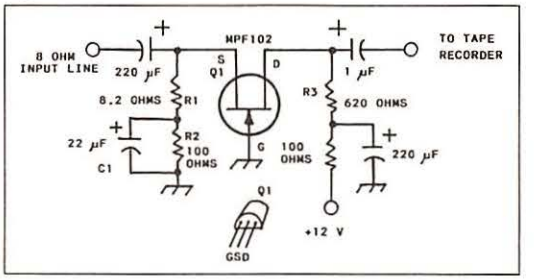
Impedance transformation can be accomplished by using a FET (field effect transistor) as shown in Figure 2. Q1 operates with its gate grounded. The 8-ohm audio is fed to the transistor source across an 8.2-ohm resistor. A 620-ohm resistor (R3) is at the drain of the FET to establish the near-600-ohm impedance required at the tape recorder input. This circuit will operate satisfactorily from a +9- or a +12-V power source. The Q1 current drain is a mere 3 milliamperes, which ensures long battery life.

The 100-ohm source resistor (R2) at Q1 is bypassed for audio by way of C1, which prevents it from becoming a part of the 8.2-ohm input impedance. A 10-ohm resistor can be used at R1 if an 8.2-ohm value is not available.

If your radio happens to have a 4-ohm output impedance, you may still use the Figure 1 circuit as shown, or you can use a 4.3-ohm resistor at R1. A 1-watt or greater resistor is recommended for R1 for those times when you mistakenly turn the receiver gain control to maximum! Normally, the receiver audio gain is kept at a very low level when tape recording is in progress. Too much audio gain will cause distortion and may damage Q1.

As with the circuit in Figure 1, be sure to use shielded audio cable between the Figure 2 circuit and the input of the tape recorder. Miniature RG-174 coaxial cable is also fine for this purpose.

Figure 2



Schematic diagram of a simple active impedance transformer that uses an FET. R1 sets the input impedance and R3 establishes the output impedance.

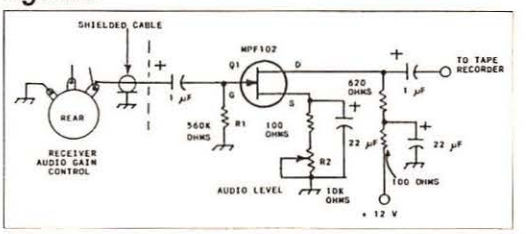
High Impedance Takeoff Point

I prefer to use the circuit of Figure 3 for tape recorder connection to my receivers. It involves going inside the receiver and making a simple connection to the audio gain control. Shielded audio cable or RG-174 is used between the gain control and the FET in Figure 3 to prevent hum pickup.

There are three terminals on most audio controls. When viewing them from the rear side, the left-hand terminal is grounded. Make your connection to the right-hand lug on the control, through C1.

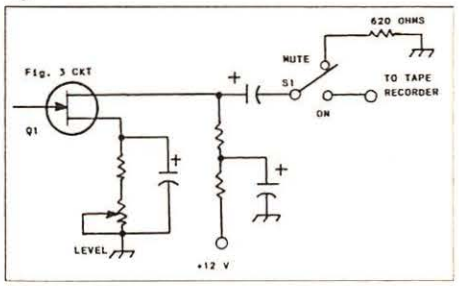
R1 establishes the input impedance of the FET by virtue of its 560K-ohm value. This impedance is substantially higher than that of the receiver sampling point, which prevents the Q1 circuit from loading the receiver audio circuit and impairing the gain and frequency response. R2 establishes the output impedance (620 ohms) of the Q1 matching trans-

Figure 3



Schematic diagram of an active impedance transformer that samples the receiver audio at high impedance. This circuit may be installed inside the receiver.

Figure 4



Method for adding a muting switch (S1) to the circuit of Figure 3.

former. R3 has been included for use as an audio level control, since Q1 provides approximately 10 dB of gain.

If the Figure 3 circuit is for permanent use with a specific radio, you may wish to install it inside the receiver, permanently. A tape input jack can then be mounted at the rear of the radio.

Should you want to add a muting circuit (rather than using the PAUSE switch on your recorder) you can add a switch to the Figure 3 circuit, as illustrated in Figure 4. S1 opens the audio line to the recorder and terminates Q1 with a 620-ohm resistor during MUTE.

■ *Circuit Construction Hints*

The circuits in Figures 2, 3 and 4 should be contained in metal shield boxes if they are used outboard from the receiver. This helps to prevent unwanted pickup of hum and stray RF signals, such as those from nearby broadcast stations, CB transmitters and the like. Point-to-point wiring on a small piece of PC board or Perfboard will suffice for these circuits. In keeping with good construction practices, keep all leads as short and direct as practicable when installing the Q1 components.

FETs other than the somewhat generic MPF102s specified in this article may be used, provided they are N-channel types. The FET characteristics are otherwise noncritical.

■ *In Summary*

The circuits described here can be used for recording your favorite music or programs from a radio. I have numerous Big Band music tapes that I recorded by means of the Figure 3 circuit. It is installed permanently in one of my home-made high-performance AM BC-band receivers. The audio quality is excellent. I use the Figure 4 muting switch to cut out the commercials and DJ chatter, which I do not want on my tapes.

Note 1: *Mouser Electronics, 2401 Hwy. 287 N., Mansfield, TX 76063-4827. Call (800) 346-6873 for a catalog or when ordering.*

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Inside the PRO-2035

The outsides of the PRO-2035 were reviewed in the Oct-94 *MT*, and it gets a closer comparison to its predecessor in this month's "Scanner Equipment." (see page 98). While those reviewers peer at the receiver's functions, we'll romp through the cavernous interior of this important new scanner.

Those who resist evolution can relax—it's still a member of the PRO-2004/5/6 family with mostly aspect and firmware revisions. Electronic design and functional hardware did not appreciably change. Most retrofit modifications and enhancements for the PRO-2004/5/6 will readily enhance the new PRO-2035. In most cases, it's self-evident how to perform established procedures because the circuits are so similar. Joy of joys!

But All That Glitters Is Not Gold

I have to do a little complaining first: The standard 9-volt Memory Retention Battery is gone! In its place is a hidden 3-volt lithium button cell soldered to the main receiver board. It's no big deal to unsolder and replace, if you halfway know what you're doing, but trouble can call if you don't know a soldering iron from a steam iron. I don't have a feel for how long these lithium cells can keep memory alive, but I'm inclined to design an easy replacement with a pair of "AA" alkaline cells in a dual holder fastened somewhere out of the way with a hook and loop (Velcro) strip. I'll think on it some and let you know.

Make no mistake about it, the PRO-2035 is unique, not just a clone; but some of that uniqueness comes at a price. For instance, the appearances and ergonomics were dramatically altered for the worse in my opinion. I'll submit that the PRO-2004 was the best of the best in the human engineering department, with its large LCD display; sloping face and tactile keypad. The PRO-2005 and 2006 took a biotechnological step down, but the PRO-2035 gets my Green Weenie of the Century Award. Just try to make your fingers fly over those itty-bitty keys haphazardly strewn all over creation on that steep, vertical front panel. If you have toothpicks for fingers and were born on Neptune, maybe . . .

Which leads to my last groan before we get down to business. Why, for Pete's Sake, wasn't the PRO-2035 designed with a computer interface to compensate for that wretched anti-human front panel? After all, you can't operate the dang thing, so it ought to be good for something a trifle more useful than a door stop.

Every Cloud Has A Silver Lining

Grumpy-mode off now, the PRO-2035 is the most advanced scanner yet, despite other class acts at double the price. What I thought at first was a slime-green electroluminescent (EL) panel backlight turns out to be nine bright LEDs positioned behind the LCD display. This is a strong plus, despite the sick color, because chemically active EL panels wear out after a time. LEDs just work and never break or wear out unless you mess with them.

Aside from ergonomics and appearances, most of the evolutionary advancement of the PRO-2035 over its predecessors is in firmware (the software that's permanently encoded into the CPU chip). The downside of this firmware revision is the impossibility of "clip-a-diode" / "add-a-resistor" modifications. Forget cellular restoration, easy speedups, and increased memory channels on the PRO-2035 by any 5-minute means.

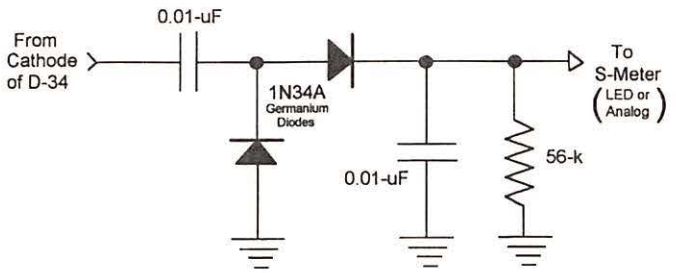
About the only possibility of directly modifying the CPU may be to replace the 8 MHz clock resonator, CX-501, with a 10-MHz quartz crystal for a modest speed increase. I don't recommend speedups by this means anymore because of the impact on other important modifications that might not work if the system clock has been altered. There is a definite risk of frying the 100-pin surface-mount CPU by running it too fast. I don't know what 'too fast" is and don't really want to find out. If you learn, please let me know so I can tell others.

Computer Interfacing is Possible

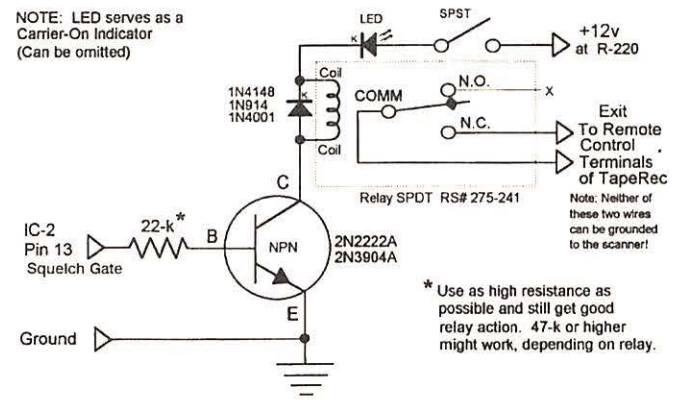
Fortunately, the PRO-2035 can be interfaced to a computer. The CE-232 Scanner/Computer Interface, designed for the PRO-2004/5/6, has been demonstrated to AutoProgram the PRO-2035's 1000-channel memory from plain ASCII text files at a rate of 1 to 2 channels per second. Beats the heck out of doing it by hand! Generically speaking, most any "keyboard emulation" technique should work fine with the PRO-2035 in terms of automated programming.

TABLE 1: *Easy Mods for the PRO-2035*

Diode Detector Circuit for S-Metering



Diode Detector Circuit for S-Metering



Data acquisition will not be possible by traditional means, thanks to the LCD Display Driver now on board the CPU instead of as a discrete chip like in the PRO-2004/5/6 series. Still, AutoProgramming is a major hurdle out of the way.

Disassembly Is Easy

Access to the PRO-2035's Logic/CPU Board, for whatever work you wish to do there, is painless and fairly easy. (Everything else is out in the wide open spaces; no disassembly required!) Remove external AC or DC power before launching the invasion. Remove the four screws that hold the front panel to the chassis; disconnect all cables that go from the front panel to various places around the receiver. Disconnect the black ground wire from the main chassis.

> **NOTE:** Memory will be lost if and when CN-502 is disconnected from the main receiver board for more than a few seconds. If this is not acceptable, you can leave CN-502 plugged in with the understanding that the Memory Battery will be providing "keep alive" power to the Logic/CPU board and therefore carries with it the risk of serious damage if you aren't sure of what you're doing. One little ZAP and the party's over! Disconnect CN-502 if there is any doubt.

Remove the four screws that hold the metal shield over the Logic/CPU Board and carefully lift up and remove the shield. Remove the two remaining screws that hold the Logic/CPU Board to the front panel.

Now comes the only tricky part: the board remains held tight to the front panel by virtue of that white 15-pin connector, CN-503, much in the same fashion that secures the PRO-2005/6 Logic Boards in their front panels. You will have to "jiggle" and work the board up and off the 15 male pins of the Keyboard PCB underneath. You can slip a flat-blade screwdriver under the Logic Board to assist matters with some gentle prying. Just be careful and patient as you work the board up and off the pins below. This process is harder to describe than to do.

When the Logic/CPU Board is free, you can commence with any of the various retrofits. Adjacent to CN-503 are fifteen unused, plated-thru holes that scream for a purpose! I suggest you insert and solder a 15-pin strip of "pin-line" sockets to facilitate easy connection of things to CN-503 later down the line. The metal shield has to be "nibbled" or notched out about 1/4" to leave room for this strip.

Any number of things may later connect to CN-503, from computer interfaces to Search and Store modules to Remote Controllers! There is no sense in soldering anything directly to CN-503, nor mechanically inserting pins into it when there is the convenience of those holes adjacent to the connector. A strip of pin-line sockets will make future work in this area a piece of cake!

Old Stuff In A New Machine

Let's conclude this month's introduction to the innards of the PRO-2035 with some clues for implementing established modifications from the PRO-2004/5/6:

Extended Memory is probably feasible thanks to what appears to be a continuation of the use of static RAM. This one is "new," however, with 28-pins which appears to be a 32k x 8 SRAM. A 128k x 8 SRAM installed in accordance with established methods should increase programmable memory by a factor of four! I'll report more on this later, so hold off unless you want to cut new turf.

S-Metering remains a cinch with the tap at the cathode of D-34. Connect a simple diode detector (see Figure) to generate an output for either an LED or an analog S-Meter.

Center Tune Metering is old hat with the tap point at TP-2 or Pin 9 of IC-2.

Extended Delay requires a bit of a deviation from the PRO-2004/5/6 method, but it's a good one! Use the circuit from last month's Workshop! The insertion point is on the wire from CN-3, Pin-6, to the receiver board. Cut that wire; insert the Extended Delay and you're in business.

SSB Reception is as elusive as ever, but you can tap the 455 kHz or 10.7 MHz IF strips and route the signal to an external shortwave receiver for processing SSB.

Data/Tone Squelch to prevent the scanner from locking up on noise, tones and computer signals. Signal tap is IC-6, Pin 14. The Control wire, where you cut and patch the DSQ Output, is the wire from CN-3, Pin 5, to the main receiver board.

Automatic TapeRecorder Switch is unchanged from the past. See drawing this month.

CTCSS Operations with the Communications Specialists, (800) 854-0547, TS-32P Decoder should be standard with the baseband audio tap at IC-2, Pin 9, TP-2, or the high lug of the Volume pot. The control connection is to the high side of the Squelch pot.

Shielding of the plastic cases is an issue. A simple approach is to coat the insides of the cases with spray adhesive and press a sheet of heavy duty aluminum foil into place over all inside surfaces. Press out the slits for the speaker and ventilation after final trimming.

Automatic Birdie Bypass, Active Frequency Tagger and most other modifications for the PRO-2004/5/6 should be applicable to the PRO-2035 almost verbatim. Please refer to back issues of *MT*, the "World Scanner Report" and my two *Scanner Modification Handbooks* for the details if you don't already know them. There's not much sense in repeating old material here.

Conclusion and Summary

The new PRO-2035 can be a hacker's dream. There's a boatload of real estate on which to install things. Access to even the most out of the way places is not more than a 10-min job. Remove the AC power transformer and wiring to create even more room and minimize heat accumulation at the same time. Most any 12-volt/1-amp DC adapter or power supply will be ample to run even a heavily modified PRO-2035.

Build and install the S-Meter and Automatic Tape Recorder circuits shown in the Figure this month and the Extended Delay from last month, and your PRO-2035 will be well on the way to becoming the *Turbowhopper* of your dreams. The PRO-2004/5/6 are gone now, but the PRO-2035 will be with us for at least a year and possibly two or three before the next generation of high performance scanners lands in our shacks.

I'll keep you posted on new developments for this fine machine, and you let me know if you hear of anything hot and new for it.

W. Clem Small, KR6A, CET

A Small-Scale, Resonant-Circuit Antenna

Most popular antenna designs used today are known as "resonant" antennas. Their action is similar to that of a tuning circuit composed of a coil and capacitor. They respond best to a signal whose frequency corresponds to their own resonant frequency.

Many antenna designs attain resonance by utilizing some combination of half-wavelength-long conductors (wires or tubing) as the resonant elements. Halfwave dipoles, Yagi-Uda beams and groundplane antennas are examples of resonant antennas, whereas Beverage antennas and active antennas using only a short whip as the receiving element are examples of non-resonant designs.

The Bilal Isotron

Measuring only 22 x 16 x 15 inches, the 40-meter Bilal Isotron is much smaller than most 40-meter antennas. It utilizes an unusual resonant-circuit design that is not composed of lengths of wire, but instead is made of a two-plate capacitor with a coil of insulated copper wire mounted between the capacitor's plates (fig. 1). Changing the position of the antenna's tuning rod varies the capacitor's capacity to tune the antenna to resonance at the desired operating frequency. No ground connection is required for operation.

Performance

Most of my testing compared the Isotron 40-meter antenna to a 40-meter halfwave dipole; both antennas were mounted at about 25 ft above ground. For receiving the relative performance of the two antennas was measured by comparing S-meter readings for the same signal; for transmitting they were compared on signal-strength reports received when alternating the antennas during contact with another station.

I was surprised that, despite its much smaller size, in many instances the Isotron compared very favorably with the dipole. Although, for both transmitting and receiving, the dipole typically outperformed the Isotron by one or two S-units, it was not really unusual for the Isotron to outperform the dipole.

In a receive-only test, the Isotron was mounted about 4 ft. above the ground on a wooden stand. As would be true of almost any antenna, the Isotron did very poorly at this height relative to the dipole, which was still at 25-ft. I also used the Isotron on this stand inside a metal-roofed, one-story garage. I didn't have the dipole for comparison on this test but I was able to receive signals and hold QSOs from that site.

I tried the Isotron antenna at several different mounting sites. Depending on the site, changing the position of the antenna's tuning rod might make only a little difference in the antenna's resonant frequency; in others it performed as desired by moving the resonant point across the band. At one point the Isotron ceased to function well. Due to a spell of rain I suspected moisture as the problem and, after keeping the antenna near a warm stove for a few hours, it again performed up its earlier levels.

It is important to follow the manual's advice on how to, and especially how *not* to, ground the Isotron. Although the instruction manual was adequate I felt that it was, in a few places, unclear and could use a bit more explanation of some of the steps in assembling the antenna. On the other hand, writing to the Bilal company produced a quick reply with suggestions on how to solve my operating problems with the antenna.

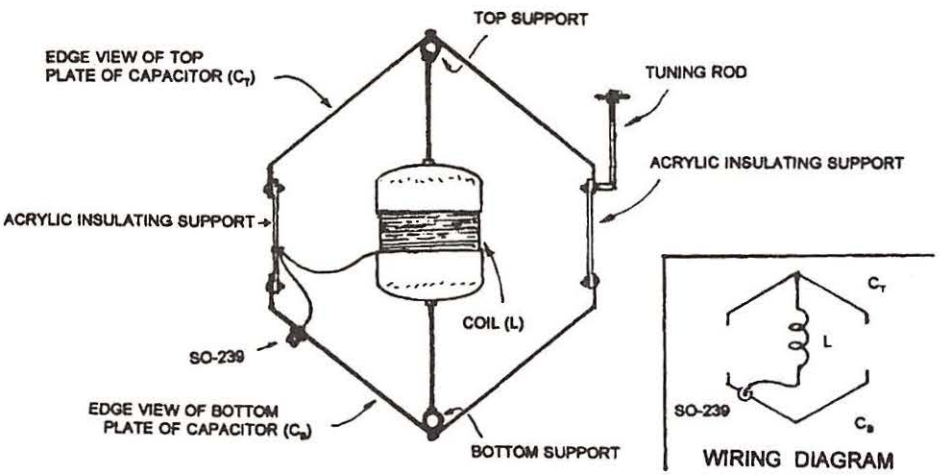


FIGURE 1: *The Bilal Isotron, 40-meter, resonant-circuit antenna, and its wiring diagram.*

Pros and Cons

I found the 40-meter Isotron antenna was able to support a lot of good communication both for reception and for two-way use. This antenna is dramatically smaller than a half-wavelength dipole, so you get a tremendous savings in the space needed to mount the antenna. You also get the convenience that it can be mounted using only one pole or tower.

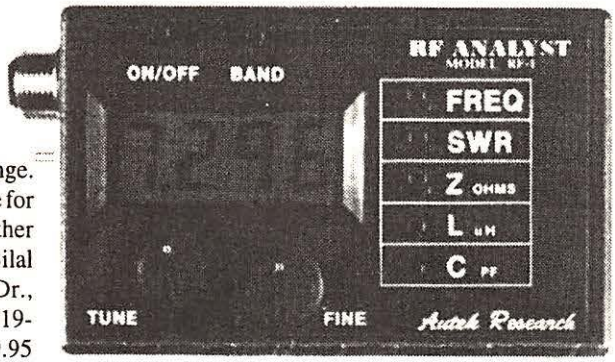
An SWR of 3:1 is acceptable for operation of this antenna; however, this may not be acceptable to some transceivers which reduce output at SWRs in excess of about 2:1. Instructions are given in the manual for using an antenna tuner in such cases. For large frequency excursions within the band it is necessary to reposition the antenna's tuning rod; to do this you must be located at the antenna which can be a problem if the antenna is atop a tall pole. On the other hand, the antenna can be easily mounted inside a building and even hidden away in an attic or crawl space.

In Summary

If you don't have space to put up a full-sized dipole antenna then, for reasons outlined above, the Isotron antenna line is one option worth considering. For HF receive-

only applications some other small antennas may be a better choice, but where transmitting is also involved few antennas that are so small will match the Isotron, especially in its price range.

Isotron antennas are available for all HF ham bands as well as for other bands by special order from the Bilal Company, 137 Manchester Dr., Florissant, CO, 80816. Phone 719-687-0650. Prices range from $39.95 to $149.95 for the ham models.



■ *An Exciting New Test Instrument*

Autek Research has developed a useful antenna and feedline test instrument called the "RF Analyst." Measuring only 4.5 x 2.5 x 1.5 inches, it is small enough to be conveniently carried in a pocket. Bracketing the HF band from 1.2 to 35 MHz, this device allows you to test antenna SWR, antenna impedance, feedline loss (feedline quality), antenna capacitive and inductive reactance, check matching stubs and baluns and more. It will also serve as a signal generator.

The RF ANALYST'S digital readout can be set to indicate either frequency of testing, SWR, impedance, capacitance or inductance. The readout can also be set to alternate between displaying any two or three of these indices so that you need not continually switch back and forth to read, for instance, variations in SWR as you change frequency.

You will find the RF ANALYST to be an extremely useful device for working with antennas, feedlines, tuners, RF networks and related components. It is available at $129.95 plus $6.00 S/H (U.S.) from Autek Research, 4143 W. Waters Ave., #120, Tampa, FL 33614, Phone 813-871-3805.

RADIO RIDDLES

■ *Last Month*

Last month I asked, "Why is the ground rod suggested for this month's antenna routing system not adequate as an RF ground for antennas, although such grounds are routinely considered acceptable for safety functions such as grounding a lightning arrestor, electromagnetic-pulse protective device or AC power system?"

Well, the ground in an AC power system is considered a safety measure; it keeps conductors such as metal equipment cabinets and metal tool frames at ground potential and thus prevents their accidentally becoming "hot" and dangerous if wiring accidentally comes in contact with them. The ground used for a EMP protective device or lightning-protection system guides lightning-induced or other EMP currents to earth via a heavy wire rather than letting them find earth through your radio (ouch!).

On the other hand, a good antenna-system ground must either provide a highly-reflective surface for waves reaching it from the antenna's elements, or it must provide a low-resistance path to return that energy, which it receives from the antenna, back to the current circulating in the antenna. Counterpoises, ground screens and ground-level radials are all means of improving—or substituting for—the earth-ground in an antenna system.

■ *This Month*

When discussing small vs. large antennas the concepts of antenna "aperture" or "capture area" often come up. What do these terms mean, and what, if anything, is "captured" by a capture area?

We'll have the answer to this month's riddle and much more in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

ASK BOB

ANSWERS TO YOUR RADIO QUESTIONS

Bob Grove, WA4PYQ

Q. *Why do HF communications receivers lack features commonly found on even the least expensive scanners—massive memory storage, fast scan speed, priority, active-frequency autostore, etc.? (Jeffrey Jones, Tracy, CA)*

A. While you are correct in questioning the absence of high-capacity memory, There is a good reason why search- and scan-related features are not popular in HF receivers.

The lower frequency spectrum is so noisy, populated, and unpredictable, that shortwave receivers often stop where there are no signals, or stop on memory channels where there used to be signals which have moved to other frequencies because of changing propagation conditions which don't affect VHF/UHF communications.

There is another reason. Current receiver manufacturers are not particularly inventive; they seem to be content spending most of their time copying other manufacturers, reducing their costs, and concentrating on cosmetics, bells, and whistles.

Q. *I have three shortwave receivers operating side by side, connected to the same antenna. Is the best receiver the one with the highest S-meter reading? (Gerald Silver, Tamarac, FL)*

A. No. S-meters are notoriously inaccurate. They show relative signal strengths among signals heard on the same receiver, indicate differences in antennas and signal directions, and are useful for adjusting the receiver to center frequency.

But a receiver suffering from high noise levels and overload may show a deceptively-high S-meter reading even though its signals will be harder to hear. Instead, use your most sensitive and accurate test equipment: your ears.

Tune in a weak signal which is encountering interference; using all three receivers' various controls for best reception.

Which sounds the best? That's the best receiver!

Q. *I heard on a cellular telephone call a "squinch" sound, then the conversation disappeared. What was the sound and where did the conversation go? (Name withheld by request)*

A. The "squinch" sound is a digital code which tells the cellular tower and the user's radio to which cell tower and frequency the conversation is about to be "handed off." During high usage times, such transfers are made as often as every few seconds to equalize the "loading"—the number of users on a particular cell site—and to assure consistent

Bob's Tip of the Month

Uniden Modifies PRO-51—*Again*

The saga continues. Uniden has performed yet another microprocessor change to disable access to the forbidden 824-825/869-894 MHz cellular bands. Models date-coded 7A4 (July 1994) which bear the FCC identification number AA020-308 can search the cellular frequencies by using the test mode as outlined in the December 1994 issue of *MT*.

Newer versions, code-dated 8A4 (August 1994) and bearing the FCC identifier AA020-308A, can be programmed in the same manner for test ranges outside the advertised frequency ranges by selecting channel 14 (66.45 MHz), 15 (76.825 MHz) or 16 (87.425 MHz), but not cellular, which used to be accessible on test-mode channel 23 (formerly 888.96 MHz, now 857.2125 MHz).

We'd like to thank *MT*'s scanner consultant Howard Bornstein for these new insights.

Hold Function for the Radio Shack Frequency Counter

An anonymous *MT* reader sent in this tip for installing a hold function on the popular Radio Shack frequency counter (catalog number 22-305). We have not tried the mod, so caveat emptor!

To perform the mod, you will need a small momentary pushbutton switch, a drill to make the hole, a small current-limiting resistor (1000 ohms at 1/4 watt--approximate value), a small length of hookup wire, and a small soldering iron and rosin core solder.

Remove the case and locate test point TP 17 on the board. Solder one end of the resistor to TP 17 and the other end to the switch. Solder the small hookup wire between the remaining switch terminal and ground (such as the black negative battery-holder lead). This completes the modification.

Better Knobs for the Bearcat BC2500XLT

Reader Phil Lewis didn't care for the tapered knobs that came with his BC2500XLT, so he cleverly improvised. He discovered that crimp rings used with F-56 connectors (Radio Shack part no. 278-217) fit perfectly over the existing knob. A wrap of viny electrical tape adds friction as well as a matching appearance, and a touch of clear nail polish on the seam secured the wrap.

To increase the grip of the outer "CHNL/FREQ" knob, Phil rubber-cemented an O-ring from a hardware department on the "CHNL/FREQ" knob, and slipped a Radio Shack #64-3025 grommet over the squelch knob (the grommet hole had to be filed slightly larger to fit).

Perhaps other readers will find alternative adaptors which they like better, but Phil is happy with his choices!

Questions or tips sent to "Ask Bob," c/o MT, are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of MT.

communications quality as mobile units change location.

Occasionally the "squinch" will be heard, but no handoff occurs, due to the unavailability of a suitable channel.

Q. *Where I can find a list of time/frequency standard transmissions around the world? (Charles Reed, Berwyn, IL)*

A. A complete list appears in my *Shortwave Directory* as well as many other guides such as the *Confidential Frequency List* by Ferrell, the *Guide to Utilities* by Klingenfuss, and the *Shortwave Listening Guidebook* by Helms, all available from Grove Enterprises and other *MT* advertisers.

Q. *How can I decode the Motorola mobile data terminal computer messages sent between police cars and dispatch? (Charles Tanner, Phoenix, AZ)*

A. In all probability, you can't. There are several packet-based, open-protocol systems, but they are mutually incompatible with other systems and probably with most hobby-type programs as well.

MDC4800 (4.8 kbaud), RDLAP (9.6/19.2 kbaud) and MMP (now obsolete) are all Motorola systems. Mobitex is an 8 kbaud system developed by GE Ericson, while CDPD is a cellular-based 19.2 kbaud system developed more recently by a consortium including IBM, McCaw, and Bell South.

Although the protocols are standardized within the industry, finding the details is an awesome task.

(Continued from page 4)

DC radio, selling with a 67 kHz SCS adapter for $38 plus $4.50 shipping. That model with a tunable adapter and LED is $42 plus $4.50. I have taken delivery of 21 of those models from GE, in damaged boxes, and I continue to offer modified GE Superadio IIIs."

Bruce Elving can be reached at P.O. Box 336, Esko, MN 557733-0336; 218-879-7676, 879-8333 fax.

	1987	1988	1989	1990	1991	1992	1993	1994
JANUARY		X	X	X	X	X	X	X
FEBRUARY		X	X	X	X	X	X	X
MARCH		X	X	X	X	X	X	X
APRIL		X	X	X	X	X	X	X
MAY		X	X	X	X	X	X	O
JUNE	X	X	X	X	X	X	X	O
JULY	O	X	X	X	X	X	X	X
AUGUST	X	O	X	X	X	X	X	X
SEPTEMBER	X	X	X	X	X	X	X	X
OCTOBER	X	X	X	X	O	X	X	X
NOVEMBER	X	X	X	X	X	X	X	X
DECEMBER	X	X	X	X	X	X	X	X

X indicates availability
O indicates non-availability

Free Offer!

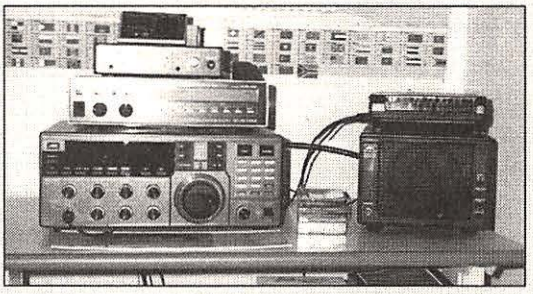
■ Reader Roy Peck says he looks forward each month to his copy of *Monitoring Times* — "one great magazine." However, he is clearing out his supply of back issues. This chart lists those he has available — free to anyone who wants one. He also has *Popular Communications* from July 1986 through April 1988 available for the asking. Write or call Roy L. Peck, 1300 Minnewaska Trail, Mississauga, Ontario, Canada L5G 3S5, 905-278-8575.

Bargain-Basement Special?

■ The Rosman Research Station, located about 30 miles south of Asheville, NC, and 150 miles from Brasstown, has been a top-secret listening station for the government since 1981. Budget cutbacks are shutting it down. Jeff Multer of Charlotte, NC, sent us a clipping from the *Charlotte Observer*, commenting, "wouldn't the Rosman site make an interesting location for the publication of *Satellite Times*?"

Jeff isn't the first one to suggest Grove Enterprises ought to relocate to the isolated monitoring site in Pisgah National Forest. But why? All that juicy classified equipment is already gone! If no buyer is found by October 1996, plans are to raze the buildings and plant it in grass.

Jeff Multer also says thanks for the review of the OS456 interface. "The review motivated me to take 'the next step' and buy a PRO-2006 (my third) and the interface. I now have a Drake R-8, an AR2515, and the PRO-2006, all linked through a Gateway Pentium PC. By the way, although I didn't go with Tandy, your report on the Tandy Sensation! [May 93], as well as the computer column in *MT*, encouraged me to take the step and buy a PC last spring. What a learning experience these past six months have been!"



Giovanni Serra's monitoring shack includes: JRC NRD525 with speaker; JPS NIR 10 filter; Telereader CWR-900 terminal unit; Grundig CR 100 tape recorder; Yaesu QTR-1 clock; Alpha Delta DX-SWL-S Sloper antenna; Kenwood HS-6 headphones, and Michelin world map.

Did the draftsman of the 2000 lire Italian banknote make a mistake . . .?

The note honors Guglielmo Marconi on the front (above), but the device on the back is not Marconi's telegraph, says Serra.

Quibbling with Numbers

■ Here are two slight corrections that could make a difference:

November 94, p.114 Sunrise-Sunset BASIC computer program, line 40:
correct "LA-L/365" to read "LA=L/365"

December 94, p.21 formula for determining the length of radials:
correct "2952" to "2808." The formula should read as follows:
2808 / Frequency (MHz) = Antenna length (inches)

Haskell Moore assures me the ground plane will work fine using the incorrect formula; however, if you wish to correct it, recalculate for the appropriate length, and cut off the extra.

How do you say, "Oops" in Italian?

■ Giovanni Serra graced us with a visit in Brasstown while on vacation in the U.S. last September. He sends a picture of himself at his home in Rome, and his radio shack. He also sent an Italian banknote which honors Guglielmo Marconi. However, Giovanni says, "The draftsman made a great oversight ... the device on the back side is not a Marconi's telegraph! Maybe the note will increase in value in the distant future!"

From the Editor

■ As we start a new year of sharing our adventures in radio, we must unfortunately say a farewell to "American Bandscan" columnist Joe Eisenberg. I have enjoyed his enthusiasm and regret he could not continue.

The start of the new year is a good time to remind our readers that *Monitoring Times* columnists are hobbyists just like you, and are always open to your input, via the U.S. mail or the Grove computer bulletin board. Messages for columnists not active on the BBS may be forwarded to them via the sysop or myself.

Maybe you have the story idea that's too big to be incorporated into someone else's column—it may be time to try your hand at writing a feature article! Call or write with your ideas or send an SASE for writer's guidelines. We also accept free-lance photography. Write for photo guidelines for more details.

Why not make this the year you see *your* monitoring times written up in the pages of *Monitoring Times*?

—Rachel Baughn, Editor

All Ohio Scanner Club: Dave Marshall, 50 Villa Rd., Springfield, OH 45503-1036. U.S. northeast of the Mississippi; VHF/UHF/HF utilities. Net Mon 9:30pm 146.940. *American Scannergram*. $18 U.S, $21 Can/Mex, $28 ww. $3 sample. Annual summer meeting.

American SW Listener's Club: Stewart MacKenzie, WDX6AA, 16182 Ballad Lane, Huntington Beach, CA 92649, (714) 846-1685. Western US, Pacific, Asia. SWBC, utilities, longwave, clandestine.*SWL*.$20 US, $22 Can/Mex. $1 sample ($2 ww). Meets1st Sats 10am address above.

Association of Clandestine Enthusiasts (A.C.E.): Kirk Baxter, P.O. Box 11201, Shawnee Mission, KS 66207. US, Europe and Middle East; Pirate and clandestine. *The A.C.E.* $18 US, $19 Can/Mex, $25 ww.

Association of DX Reporters (ADXR): Reuben Dagold, 7008 Plymouth Rd., Baltimore, MD 21208. International; Utilities, ham band, QSLing, MW, LW, and SWBC. *DX Reporter*. $19 US, $29 Can/Mex, $22ww. $1 or 5 IRC's sample.

Association of Manitoba DX'ers (AMANDX): Shawn Axelrod, 30 Becontree Bay, Winnipeg, Manitoba, R2N 2X9 Canada, (204) 253-8644. Manitoba; LW, MW, SW, and VHF/UHF. Meets monthly. $2.

Bay Area Scanner Enthusiasts: Bruce Ames, P.A.O., 105 Serra Way #363, Milpitas, CA 95035, (408)267-3244. Western U.S.; 25+ MHz. *Listening Post* (bi-monthly). Meets 2nd Mons. 7:30 Milpitas Police Admin Bldg. $25 US, $2 sample, or SASE for info.

Bayonne Emergency Radio Network (BERN): Ray Baron/Bob Frasca, P.O. Box 1203, Bayonne, NJ 07002-6203, 1-800-286-2876. Metro NJ, NY; Fire/disaster, pub safety.

Bearcat Radio Club: Larry Miller, Box 360, Wagontown, PA 19376, 1-800-423-1331. National. Scanning only. *National Scanning Report* (bi-monthly). $17.50 or $29.90, $5 more Can. $3 sample.

Boston Area DXers: Paul Graveline, 9 Stirling St., Andover, MA 01810-1408, (508)470-1971, 50 mile radius Boston; 3-30 MHz. Meets 3rd Fris 7:30pm, Bull Billerica Facility, 300 Concord Rd., Billerica.

British Columbia Shortwave Listening Club (BCDX): Box 500, 2245 Eton St., Vancouver, BC Canada V5L 1C9, (604) 255-8987 fax. Shortwave. *LOGJAM*. Meets 3rd Thurs. 7pm at 920 Davie St.

Canadian Int'l DX Club: Sheldon Harvey, 79 Kipps St., Greenfield Park., Quebec, Canada J4V 3B1, (514)462-1459. Canada nationwide/membership open to all; General coverage. *The Messenger*. $26 Can, $25 US, $US28 or $Can35 ww. $2 sample. Meets 2nd Tues 7pm Montreal; several annual events.

Capitol Hill Monitors: Alan Henney, 6912 Prince Georges Ave, Takoma Park, MD 20912-5414, (301) 270-2531/5774 fax. DC, MD, No.VA, So.DE. Scanner bands. Frequency Forum BBS 703-207-9622 (8-N-1) Net 1st & 3rd Mons 7:30pm 146.91. *Capitol Hill Monitor*. $8. Meets irregularly.

Central Florida Listeners Group: David Grubbs N4EF, 956 Woodrose Court, Altamonte Springs, FL 32714-1261; (407) 296-2055 Andy Fountain. Central Florida; All bands. Net on 146.73 MHz Sun 8 pm. Meets 2nd Sats 12 noon. Conf#10 on Laser BBS (407)647-0031.

Central Indiana Shortwave Club: Steve Hammer, 2517 E. DePauw Road, Indianapolis, IN 46227-4404. Central Indiana; SW broadcasting, pirates, and the offbeat. *Shortwave Oddities*.

Central VA Radio Enthusiasts: Richard Rowland, POB 34832, Richmond, VA 23234-0832. Metro Richmond and vicinity. VHF/UHF. SASE. No newsletter, no dues. Meets quarterly in Richmond.

Chicago Area DX Club: Edward G. Stroh, 53 Arrowhead Dr., Thornton, IL 60476. 300 mile radius of Chicago; DXing all bands. *DX Chicago*. $17, $1 sample. Meets irregularly.

Chicago Area Radio Monitoring Association (CARMA): Ted & Kim Moran, 6219 N. Greenview, Chicago, IL 60660-1815. Chicago & midwest. Public safety & general coverage. SCUG/CARMA BBS (708)852-1292. *CARMA Newsletter*. Meetings (Sats) and newsletter bi-monthly on alternate months.

Colorado Shortwave Listeners Club: Rob Harrington N0NNI, P.O. Box 370593, Denver, CO 80237-0593, 303-756-9455. Longwave, shortwave. *Colorado Shortwave Listener* (4x) 35 cents each. Meets 1st Sundays.

Communications Research Group: Scott Miller, 122, Greenbriar Drive, Sun Prairie, WI 53590-1706. Wisconsin area. Scanning.

DecalcoMania: Paul Richards, P.O. Box 126, Lincroft, NJ 07738, (908)591-2522. Worldwide AM, FM and collecting radio related items. *DecalcoMania*. $10 US, $11 Can/Mex, $16 Eur, $17.50 Asia/Pac.

Drake SPR4 Int'l Club: Bill Swiger, Route 1, Box 142A, Bridgeport, WV 26330. Worldwide; Drake SPR4 owners.

Fire Net: Tom Kravitz, Box 1307, Culver City, CA 90232, 310-838-1436, internet mpage@netcom.com. All of California; fire, EMS, tied in with nationwide notification net.

Global DX Club: David Williams, P.O. Box 1176, Pinson, AL 35126-1176; Internet: XYVD51A@Prodigy.Com. Worldwide; all bands. *Radio Waves* (bi-monthly). $1 sample. Meets monthly.

Houston Area Scanners & Monitoring Club: Glen Dingley, 909 Michael, Alvin, TX 77511, (713) 388-1941. 75 mile radius of Houston, TX; scanning & SW. Paging network. *HASMC Newsletter*. Meets Jan & June.

Hudson Valley Monitors Association (HVMA): Patrick Libretti, P.O. Box 706, Highland, NY 12528. Mid-Hudson valley and surrounding counties; VHF/UHF, public safety. *The Hudson Valley Monitor*.

International 11 Meter Alliance: Allen Newton, Rt. 1 Box 187-A, Whitney, TX 76692, (817) 694-4047. Public safety, traffic handling, all bands, esp. 11 meters.

Int'l Radio Club of America (IRCA): Ralph Sanserino, P.O. Box 1831, Perris, CA 92572-1831. Worldwide; BCB/AM DX. *DX Monitor (34 x)* $25 US, $27 Can/Mex, $28.50 ww. $.29 or 2 IRCs sample.

Longwave Club of America: Bill Oliver, 45 Wildflower Rd., Levittown, PA 19057, (215) 945-0543. Worldwide; Longwave only. *The Lowdown*. $18 US, $19 Can/Mex, $26 ww.

Listeners' Nets

You are invited to post your North American amateur radio net in this bi-monthly listing if its primary emphasis is devoted to the radio monitoring hobby (not amateur radio).

Capitol Hill Monitors
146.91 MHz 1st & 3rd Mon 7:30pm ET, DC, Md, N.Va, S.Del; Scanning and amateur radio
Frequency Forum BBS 703-207-9622 [8-N-1]
Net Mgr: N3RDC, John Korman
Call Alan Henney 301-270-2531 or John Korman 301-299-5455 for info
Newsletter $8; 6912 Prince George's Ave, Takoma Park, MD 20912-5414

Central Florida Listeners Group
146.730 MHz, Sun 8pm ET, Central Florida; any radio communications outside amateur bands
Net Mgr: N4EF
Telephone gateways announced; CFLG BBS conference on LASER BBS 407-647-0031
Call Mark Kuziv, KC4ZVK, 407-933-7163 for info

Larkfield's ARC SW-Scanner Net
147.210 MHz, Fri 8pm ET, Long Island, NYC, NJ, Conn; Shortwave BCers & utes, MW, amateur radio, scanning
Net Mgr: Hank Lukas, N2GCN
Open to all amateurs on air; by letter for scanner listeners
Contact: P.O.Box 115, Plainview, NY 11803-0115

Montreal DX Listeners Net
146.910 MHz, Sun 8:15 pm ET, Montreal PQ area; MW SW, & Scanner
Net Mgr: Sheldon Harvey VE2SHW
Telephone gateways announced

Monitoring the Long Island Sounds Net
146.805 Tues 8pm ET, Long Island, NY; Primarily scanning
Net Mgr: WB2RVA, 2134 Decker Ave, North Merrick, NY 11566

Monix SW and Scanner Listeners Info Net
146.835 MHz, Thurs. 9:30 pm ET; Cincinnati/Tri-State Area; All band
Net Mgr: Mark Meece, N8ICW, (513) 777-2909 (no collect calls)
Open to all amateurs; Telephone gateways to net mgr up to 1/2 hr before net; The Listening Post BBS (513) 474-3719

New York DX Association
146.880 Mon 9pm ET, NYC area; "DC to Light"
Net Mgr: Charles Hargrove N2NOV, 723 Port Richmond Avenue, Staten Island, NY 10302-1736
Voice mail 1/2 hr before net: 212-978-3375; Compuserve 73167,312

Northeast SW Listeners and Scanners Net; Rip Van Winkle Society
147.21 MHz (WB2UEB) Wed 8pm, Albany, NY, area.
Net Mgr: Ray Loeper N2RAD

Rocky Mountain Monitoring Net
147.225, 224.980 Denver; 145.460 Boulder; 145.160 Colorado Springs Sun 20:00; communications monitoring
Brian Gould, KB0MEP, Mt. News Net

Shortwave Listeners Net, Association of North American Radio Clubs
7.240 MHz LSB, Sun 10am ET, Eastern US; Shortwave broadcasts and utilities
Net Mgr: KW3F, 238 Cricklewood Circle, Lansdale, PA 19446
Telephone gateways announced

Southern Wisconsin SW Listeners Net; MARA
147.150 MHz, alt 146.760 MHz. Madison, WI, area
First Sun 8pm CT. Shortwave, scanning, dc to daylight, equipment notes and comments.
Net Mgrs: N9LTD, KA9SRU, N9EWO
Contact: N9EWO, Dave Zantow, 1609 Ontario Drive, Janesville, WI 53545

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Jan 8	South Bend, IN	Michiana Valley Hamfest Assoc/ Bob Denniston KA9WNR, 21970 Kern Road, South Bend, IN 46614, (219) 291-0252
Jan 14	Lancaster, PA	Columbia Area ARC / Dutch Country Comp & Comm Show, P.O. Box 682, E. Petersburg, PA 17520-0682, (717) 560-2072. Location: Lancaster Host Resort and Conference Center, Rte 30, E. Lancaster. $5 general admission. Talk-in 146.715
Jan 14-15	Sarasota, FL	Sarasota Hamfest & Computer Show / Ed Neely, KC4RYC, 2632 Sunnyside St, Sarasota, FL 34239; (813) 366-5564. Location: Robarts Sports Arena, Sarasota Fairgrounds. 9-5 Sat, 9-3 Sun, $7 general admission. Talk-in 146.31/91, 444.925, 146.13/73
Jan 15	Yonkers, NY	Metro 70cm Network / Otto Supliski WB2SLQ, 53 Hayward St., Yonkers, NY 10704 (914) 969-1053
Jan 15	Richmond, VA	Richmond ATS / Becky Holberg KD4VOZ, 7101 Fernwood St #2732, Richmond, VA 23228, (804) 264-8218
Jan 21	Loveland, CO	Northern CO ARC Winter Superfest / Randy Long WB6AVV (303) 226-1529. Location: Larimer Co. Fairgrounds, 9-3. $3 general admission. Talk-in 144.515/145.115
Jan 21	St. Joseph, MO	Missouri Valley ARC, Green Hills ARC, Ray Clay ARC / Gaylen Pearson WB0W, 1210 Midyett Rd., St. Joseph. MO 64506 (816) 232-8786
Jan 21	Hammond, LA	SE Louisiana ARC / Ernest Bush N5NIB, 12447 General Ott Rd., Hammond, IN 70403 (504) 542-0034
Jan 21	Crystal River, FL	Sky High ARC / Ronald Wilhite KK4HS, 303 S. Adams St., Beverly Hills, FL 32665, (904) 746-2022
Jan 21	Monterey, CA	Naval Postgraduate School ARC / Cal Miller WW7G, 969 B Pacific St., Monterey, CA 93940, (408) 649-5347
Jan 22	Nelsonville, OH	Sunday Creek ARF / Russell Ellis KG8JI, 8051 Oregon Ridge, Glouster, OH 45732, (614) 767-2226
Jan 22	Buena Pk, CA	Ray Briem Appreciation Day / So. Cal. Area DXers, 16182 Ballad Lane, Huntington Beach, CA 92649-2272 (717) 846-1685. Location: Knott's Berry Farm 12-4pm, $21.95, includes complete meal, parking, gifts.
Jan 28	St. Charles, MO	St. Louis Rptr Inc / James Welby WB0ZJW, PO Box 50202, St. Louis, MO 63105, (314) 353-2000
Jan 28	San Diego, CA	Challenger Jr High School ARC, KI5YG / Special event station to commemorate 9th anniversary of Space Shutte Challenger tragedy. Operation on or near 14.250, 21.350, and 28.350. For QSL, card send QSL and SASE to Challenger JHS ARC, 10810 Parkdale Ave, San Diego, CA 92126. SWL reports welcomed.

Monitoring Times is happy to run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to:**Monitoring Times Special Events Calendar** P.O. Box 98, Brasstown, NC 28902-0098.

DX Radio Tests

These special test broadcasts provide a unique opportunity to hear and identify the following stations. If you hear their broadcasts, please let the engineer know at the address provided. More information on DXing the broadcast band can be found in *DX Monitor*, the publication of the International Radio Club of America (IRCA, P.O. Box 1831, Perris, CA 92572-1831, USA) and *DX News*, the publication of the National Radio Club (NRC, P.O. Box 5711, Topeka, KS 66605-0711). Both clubs are devoted to the hobby of hearing distant stations on the standard AM and FM broadcast bands.For a sample of either publication, send one 29 cent stamp ($1 US or 1 IRC overseas) to the addresses above. The following tests were arranged by J.D. Stephens for IRCA unless otherwise noted.

Monday, Jan 2 - WWSW-970, 1 Allegheny Square, Pittsburgh, PA 15212, will conduct a DX test between 12-12:30 am EST. The test will include test tones, voice IDs, and Morse code IDs. Reception reports may be sent to Mr. Phil Lenz, Assistant Engineer.

Saturday, Jan 7 - KIUP-930, PO Drawer P, Durango, CO 81302, will conduct a DX test between 7:15-7:45 am EST. The test will include test tones, voice IDs and Morse code IDs. Reception reports my be sent to Mr. John Morton, Chief Engineer.

Monday, Jan 9 - KTNS-1090, 40356 Oak Park Way, Oakhurst, CA 93644, will conduct a DX test between 8-9:00 am EST. The test will include country music, voice IDs, and Morse code IDs. Reception reports may be sent to Mr. Larry Gamble, General Manager.

Sunday, Jan 15 - KUAU-1570, PO Box 565, Kuau, Maui, HI 96779, will conduct a DX test between 5:01-5:30 am EST. The test will include Morse code IDs. Reception reports may be sent to Mr. Richard Miller, Owner. **Note: This test will be repeated on Monday, January 16.**

Monday, Jan 16 - WVWI-1000, PO Box 5678, Charlotte Amalie, St. Thomas, U.S. Virgin Islands 00803-5678, will conduct a DX test between 2-3:00 am EST. The test will include voice IDs, Morse code Ids, and "easily identifiable music." Reception reports may be sent to Mr. Rick Ricardo, Director of Operations.

Monday, Jan 16 - KUAU-1570 (See Sunday entry above)

Monday, Jan 30 - CFRY-920, 1500 Saskatchewan Avenue West, Portage la Prairie, MB R1N 0N6, Canada, will conduct a DX test between 1-1:30 am EST. The test will include country music, voice IDs, and Morse code IDs. **Power will be 25 kW using their daytime antenna pattern.** Reception reports may be sent to Mr. Red Hughes, Station Manager. **Note: CFRY will keep a playlist of songs played during the test, so report any song titles you hear.**

INDEX OF ADVERTISERS

STOCK EXCHANGE

Monitoring Times assumes no responsibility for misrepresented merchandise.

Ads for **Stock Exchange** must be received 45 days prior to publication date. All ads must be paid in advance to *Monitoring Times*.
Ad copy must be typed for legibility.

NON-COMMERCIAL SUBSCRIBER RATES: $.25 per word — *Subscribers only!*
All merchandise must be personal and radio-related.

COMMERCIAL RATES: $1.00 per word. Commercial line ads printed in bold type.

1-3/4" SQUARE DISPLAY AD: $50 per issue. Send camera-ready copy or copy to be typeset. Photo-reduction $5 additional charge. For more information on commercial ads, contact Beth Leinbach, 704-389-4007.

"TINY-TENNA!" See display ad page 79 this issue.

R-390-A SALES—SERVICE—PARTS. Information SASE Miltronix, P.O. Box 3541, Toledo, OH 43608.

GE SUPERADIO III, custom designed with up to four noise-free SCA channels. Performance guaranteed. Credit Card orders accepted. (800) 944-0630.

HOME AUTOMATION. Become a dealer in this fast-growing field. Free information. Call 800-838-4051.(01-95)

Highest price paid for used scanners! (614)544-5842 (03-95)

Sony SW-55, mint. $275. Yaesu FT811 UHF, mint, (out of band). $300. PRO-43, mint, cellular restored, with custom leather case. $300. Contact George Philips 718-225-1000.

THE ANARCHIST'S BBS is a resource for anarchists, investigators, researchers, computer hackers and phone phreaks. Categories include: Computer hacking, Investigation techniques, Telecommunications Technology and Surveillance. Call 214-289-8328 for free trial access

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Mint AR-3000 receiver, $500. Call W8ISG, (616)731-5600 days or leave message.(1-95)

Take heed SHORTWAVE LISTENERS. Are you planning to deal with Mike Papagorgio's coin show "Money Makes Money"? Please contact me before you buy from him. George DiPrinzio 837 E 232 St., Bronx, NY 10466 or call collect (718) 231-5638. (01-95)

For Sale: Grundig YB-500. Excellent condition. Less than 1year old. Still under warranty. Extras included, $200. Call Brian, 717-399-9291.

TRADE: AOR-2500, SSB, computer control with cellular for AOR-1500 with cellular or Trident TR-2400. George (804) 495-7483.

PRO-43, two nicad packs, Design E.Q. cas. adapter charger, $225. PRO-2005, all accessories, $210. Timewave DSP9 $100. Panasonic RF-B45 $90. Jim WB4ZCD (606) 441-9684.

FOR SALE: ICOM R7100, mint condition, full coverage, FM 30kHz mod., 9 months old, $1400. Includes Fed-Ex shipping. Original box and service manual. Call Dan (216) 327-1884, 9am-1pm EST.

SALE: Yaesu FRG-8800 Receiver with extras, $375, or best offer. Also, Zenith Transoceanic $100 plus shipping. Both excellent. Phone (619) 549-4243.

Wanted: ICOM R-1 handheld receiver. Ask for Drew. Call day (215) 657-1191. night (610) 789-3938.

For Sale: ICOM R-7100 with voice option installed. Mint Condition. Less than 1 year old. $1250. Call (615) 791-5763.

NRD-525 Excellent, $595 Shipped. ICOM R-7000, Excellent, Grove Mods, TV Adaptor, $925 Shipped. Jim (817) 540-4331.

CLOSING COMMENTS

Bob Grove
Publisher

Where are the Trunk-Tracking Scanners?

Hardly a day goes by that we don't receive calls from scanner listeners wondering how they can follow the new 800 MHz trunking systems. It's frustrating to hear a transmission which gets your attention, knowing full well that the reply is going to be on some other channel and you have no idea where to look.

Why aren't there any trunk-tracking scanners? While the Electronic Communications Privacy Act of 1986 forbids us from listening to scrambled communications, trunking is not a privacy system; it is for spectral efficiency. And while the ECPA also forbids listening to mobile telephones, trunking is not that, either. Listening to it is lawful. So why aren't there any trunking-compatible scanners?

First, several trunking technologies exist; a single scanner capable of following them all would have to have some very sophisticated (read: "expensive") digital software; this would make it less cost-competitive in the consumer marketplace.

Second, trunking systems may utilize proprietary software to manage their systems. But what if the system we use to track it is not the same as that used by trunking software? Would this not simply be an alternative method of detecting a radio signal in the clear?

I think the real answer as to why we don't see any trunk-tracking scanners on the consumer market is the uninspired, profit-driven, Japanese commitment to hawking superficiality—glitz and glamour—rather than performance. They seem to have adopted the Madison-Avenue buzz: sell the sizzle, not the steak.

How many imaginative advancements have you seen in Bearcat scanners over the last decade since Uniden bought out Electra and Regency? What noteworthy improvements over the classic BC250 and BC300 have been made in frequency coverage, dynamic range, selectivity or modes, not even mentioning trunk-tracking capability?

The primary improvements have been scan/search speed, memory capacity and military aircraft coverage. All textbook stuff. With Uniden having acquired nearly all the basic scanner patents, their learning curve should be going up, yet some of their latest products have been retired early due to poor design.

But they did look good.

Interceptors®

The Interceptor® series offers quality design in a portable package. The R10 and R20 Interceptors® are near field receivers used for communications monitoring and counter surveillance applications. With use of the signal strength bargraphs they are ideal for locating stuck transmitters. Unlike scanners and receivers that must be tuned to a specific frequency or scanned through a fixed frequency range, The Interceptors® will instantly tune to strong signals.

R10 ..... $359.

- *New* squelch delay feature
- *New* high intensity LEDs & low battery indicator
- Continuous 30MHz - 2GHz coverage in less than 1 second
- Check deviation & signal strength
- Skip button lets R10 scan to next signal
- Completely automatic, no tuning necessary
- Built in speaker or headphones

R20 ..... $119.

- Pager sized, with built in telescoping whip antenna
- 9 volt battery operation
- Monitor Aircraft, CB, AM broadcast transmissions when close
- Check Microwave oven leakage
- Wide .5MHz - 3GHz frequency range

Decoders

To measure Tones and Codes off the air, the TC200 & DC440 Decoders are the units of choice. The Optoelectronics Decoder line can be used with any scanner, service monitor, or communications receiver to monitor PL and DPL tones.

DC440 ..... $259.

- 50 CTCSS tones, 106 DCS codes and 16 DTMF characters
- Convenient front panel controls for Power, Mode and Recall
- New CI-V compatible interface for PC
- Compact Size ideal for mobile or portable operation with optional NiCad battery pack ($39.)
- 2 line by 16 character back-lit display

TC200 ..... $179.

- Measures CTCSS tones only
- Fast - .1Hz resolution with .2 second display update
- Large 4 digit, .5" LCD display
- Low power design, 5+ hours operation

MORE THAN JUST COUNTERS!

Filters Filters Filters!

Opto offers a full line of filters and amplifiers to increase maximum performance.

APS104 ..... $995.
Tunable band pass filter system from 10MHz - 1GHz. Maintains a constant 4MHz band width over the entire range. Extends near field detection 10x typical.

N100 ..... $99.
FM broadcast band notch filter. Reduces interference from FM stations.

CF802 ..... $149.
Cellular Band Pass Filter and Amplifier. 825 - 845 MHz pass band with 10dB gain amplifier.

BHP800 ..... $40.
High Pass filter for frequencies above 800MHz.

BLP70 ..... $36.
Low pass filter for frequencies below 70MHz.

Computer Controlled Scanning Board

OptoScan OS456 ..... $299.

Computer controlled scanning board for the popular Radio Shack Pro 2005/6 scanners. The OS456 takes full computer control of your scanner allowing it to perform simply and effortlessly. You will be amazed at the OS456's 50 channels per second scanning. With its ability to Decode CTCSS Tones, DCS Codes and DTMF Characters, the OS456 becomes a necessary tool for the serious Radio Monitoring Enthusiast.

- High Speed 50 Channels per second scanning!
- CTCSS & DCS Controlled Scanning and Logging
- DTMF Decode & Log with Channel and Time
- RS 232C & CI-V Interface
- No drill or solder installation

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Only 4" high!

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